500 West Cummings
Park, Suite 3600 Woburn,
Ma 01801

Telephone: 781-771-2255
Email
jeff.barbadora@crowncastle.com

June 27, 2014

Melanie A. Bachman
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: Sprint PCS-Exempt Modification - Crown Site BU: 806376
Sprint PCS Site ID: CT03XC251
Located at: 1455 Forbes Street, East Hartford, Connecticut

Dear Ms. Bachman:

This letter is to confirm that all construction activity has been completed. Pursuant to the Connecticut Siting Council approval of **EM-Sprint-Nextel-043-130429, t**his letter is to satisfy item number three of the approval letter that the CSC will be notified in writing within 45 days after completion of construction.
.
Please contact me if you have any questions.

Sincerely,

Jeffrey Barbadora
781-970-0053

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

May 17, 2013

Jeff Barbadora
Crown Castle
3530 Torrington Way, Suite 300
Charlotte, NC 28277

RE: **EM-SPRINT-NEXTEL-043-130429** – Sprint Nextel notice of intent to modify an existing telecommunications facility located at 1455 Forbes Street, East Hartford, Connecticut.

Dear Mr. Barbadora:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Prior to antenna installation, the monopole reinforcements identified in the Structural Modification Report prepared by Paul J. Ford and Company dated February 26, 2013, and stamped by Kevin Bauman shall be implemented;
- Within 45 days following completion of the antenna installation, a signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that the recommended modifications have been completed and the structure and foundation do not exceed 100 percent of the post-construction structural rating;
- Any deviation from the proposed modification as specified in this notice and supporting materials with the Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated April 25, 2013. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73.

Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

Melanie A. Bachman
Acting Executive Director

MAB/CDM/cm

c: The Honorable Marcia A. Leclerc, Mayor, Town of East Hartford
Michael J. Dayton, Town Planner, Town of East Hartford

CROWN CASTLE

Crown Castle
3530 Toringdon Way
Suite 300
Charlotte, NC 28277

Tel: 704-405-6600

www.crowncastle.com

April 25, 2013

EM-SPRINT-NEXTEL-043-130429

Linda Roberts
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: **Sprint Nextel-Exempt Modification - Crown Site BU: 806376**
Sprint Nextel Site ID: CT03XC251
Located at: 1455 Forbes Street, East Hartford, CT 06118

Dear Ms. Roberts:

This letter and exhibits are submitted on behalf of Sprint Nextel (Sprint). Sprint is making modifications to certain existing sites in its Connecticut system in order to implement their network vision technology. Please accept this letter and exhibits as notification, pursuant to § 16-50j-73 of the Regulations of Connecticut State Agencies ("R.C.S.A."), of construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In compliance with R.C.S.A. § 16-50j-73, a copy of this letter and exhibits is being sent to The Honorable Marcia A. Leclerc, Mayor for the Town of East Hardford.

Sprint plans to modify the existing wireless communications facility owned by Crown Castle and located at **1455 Forbes Street, East Hartford, CT 06118**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to Sprint's operations at the site (Exhibit-3).

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") § 16-50i(d) because the general physical characteristics of the facility will not be significantly changed. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in the R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing tower. Sprint's replacement antennas will be located at the same elevation on the existing tower.

2. Although the proposed modifications will involve replacing the ground-mounted equipment, the proposed change will not require the extension of the site boundaries.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table report for Sprint's modified facility is included as Exhibit-3.

5. A Structural Modification Report confirming that the tower and foundation can support Sprint's proposed modifications is included as Exhibit-2.

For the foregoing reasons, Sprint respectfully submits the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Jeff Barbadora
Property Specialist

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: General Power Density Table Report (RF Emissions Analysis Report)
Tab 3: Exhibit-3: Structural Modification Report

CC: The Honorable Marcia A. Leclerc, Mayor, Town of East Hardford

Exhibit – 1

Full Construction Drawings, Stamped & Sealed

(Insert A&E Drawings Complete – FST Task 25.0)

SHEET INDEX

NO.	DESCRIPTION
T1	TITLE SHEET
C1	GENERAL NOTES
C2	COMPOUND SITE PLAN & ELEVATION
C3	EQUIPMENT SITE PLANS
C4	EQUIPMENT DETAILS
C5	ANTENNA PLANS
C6	ANTENNA CABLE RISER & GPS DETAILS
C7	EQUIPMENT DETAILS
C8	RF AND CABLE DETAILS
C9	FIBER DISTRIBUTION BOX DETAILS
E1	UTILITY SITE PLAN
E2	DETAILS
E3	GROUNDING PLAN AND DETAILS

DRIVING DIRECTIONS

DEPART FROM SPRINT:
1 INTERNATIONAL BLVD MAHWAH, NJ 07430

1. HEAD NORTH ON INTERNATIONAL BLVD/PARK ST TOWARD QUEENSLAND RD.
2. TAKE THE 3RD RIGHT ONTO PARK LN.
3. CONTINUE STRAIGHT ONTO LEISURE LN.
4. CONTINUE ONTO NJ-17 N.
5. TAKE THE NEW JERSEY 17 N/INTERSTATE 287 N EXIT TOWARD INTERSTATE 87/NORTH Y. THRUWAY.
6. KEEP LEFT AT THE FORK, FOLLOW SIGNS FOR I-287 N/I-87/NJ-17 N/NY. THRUWAY AND MERGE ONTO I-287 N/NJ-17 N.
7. KEEP RIGHT AT THE FORK, FOLLOW SIGNS FOR I-87 S/I-287/TAPPAN ZEE BR/NEW YORK CITY/NEW YORK THRUWAY AND MERGE ONTO I-287 E/I-87 S.
8. TAKE THE EXIT ONTO I-95 N.
9. TAKE EXIT 48 ON THE LEFT TO MERGE ONTO I-91 N TOWARD HARTFORD.
10. TAKE EXIT 25 TO MERGE ONTO CT-3 N TOWARD GLASTONBURY.
11. TAKE THE EXIT TOWARD GLASTONBURY/MAIN ST.
12. TURN LEFT ONTO GLASTONBURY BLVD.
13. CONTINUE ONTO GRISWOLD ST.
14. TURN LEFT ONTO PROSPECT ST.
15. CONTINUE ONTO FORBES ST.
DESTINATION WILL BE ON THE LEFT.

Sprint™

NETWORK VISION MMBTS LAUNCH

NORTHERN CONNECTICUT MARKET

SPRINT SITE NAME

EAST HARTFORD (CROWN)

CROWN CASTLE SITE NAME

HRT 100 943239

SPRINT SITE NUMBER

CT03XC251

CROWN CASTLE NUMBER

806376

SITE ADDRESS

1455 FORBES STREET
EAST HARTFORD, CT 06118

STRUCTURE TYPE

MONOPOLE

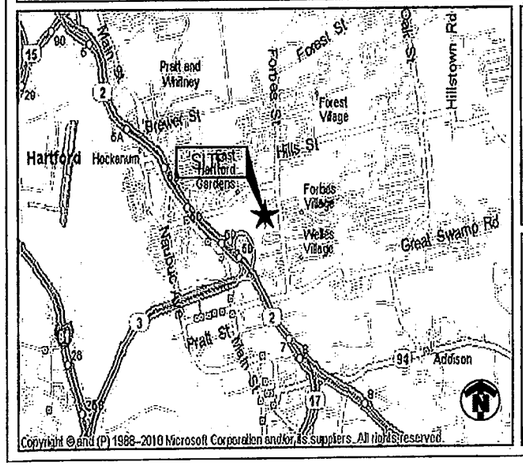
OWNER AND TENANT MAY, FROM TIME TO TIME AT TENANT'S OPTION, REPLACE THIS EXHIBIT WITH AND EXHIBIT SETTING FORTH THE LEGAL DESCRIPTION OF THE SITE, OR WITH ENGINEERED OR AS-BUILT DRAWING DEPICTING THE SITE OR ILLUSTRATING STRUCTURAL MODIFICATIONS OR CONSTRUCTION PLANS OF THE SITE. ANY VISUAL OR TEXTUAL REPRESENTATION OF THE EQUIPMENT LOCATED WITHIN THE SITE CONTAINED IN THESE OTHER DOCUMENTS IS ILLUSTRATIVE ONLY, AND DOES NOT LIMIT THE RIGHTS OF SPRINT AS PROVIDED FOR IN THE AGREEMENT. THE LOCATIONS OF ANY ACCESS AND UTILITY EASEMENTS ARE ILLUSTRATIVE ONLY. ACTUAL LOCATIONS MAY BE DETERMINED BY TENANT AND/ OR THE SERVICING UTILITY COMPANY IN COMPLIANCE WITH LOCAL LAWS AND REGULATIONS.

UNDERGROUND SERVICE ALERT
CALL TOLL FREE
1-800-922-4455
THREE WORKING DAYS BEFORE YOU DIG

PROJECT SUMMARY

SITE NAME:	EAST HARTFORD (CROWN)	
SITE NO.:	CT03XC251	
SITE ADDRESS:	1455 FORBES STREET EAST HARTFORD, CT 06118	
COUNTY:	HARTFORD	
SITE COORDINATES:		
LATITUDE:	41° 43' 53.23" N	(NAD 83)
LONGITUDE:	72° 36' 27.99" W	(NAD 83)
GROUND ELEV.:	±74'	(AMSL)
JURISDICTION:	CONNECTICUT SITING COUNCIL	
LANDLORD:	CROWN ATLANTIC COMPANY LLC. 2000 CORPORATE DRIVE CANONSBURG, PA 15317 (704) 405-6555	
APPLICANT:	SPRINT 1 INTERNATIONAL BLVD. MAHWAH, NJ 07495	
PROJECT MANAGER:	ALCATEL LUCENT 1 ROBBINS ROAD WESTFORD, MA 01886	
CONTACT:	ISAM ELHALWANI (617) 851-6133	
CONSTRUCTION MANAGER:	MIKE CALLAHAN (860) 919-7278	
ENGINEER:	INFINIGY 11 HERBERT DRIVE LATHAM, NY 12110	
CONTACT:	PAUL FANOS (518) 690-0790	
TELCO PROVIDER:	AT&T (800) 288-2020	
POWER PROVIDER:	CONNECTICUT LIGHT AND POWER (860) 947-2000	
BUILDING CODE:	2003 INTERNATIONAL BUILDING CODE 2005 CONNECTICUT BUILDING CODE W/ 2009 AMENDMENT UNIFORM MECHANICAL CODE UNIFORM PLUMBING CODE LOCAL BUILDING CODE CITY/COUNTY ORDINANCES	
ELECTRICAL CODE:	2005 NATIONAL ELECTRICAL CODE	

VICINITY MAP



PROJECT TEAM

ALCATEL·LUCENT

1 ROBBINS ROAD
WESTFORD, MA 01886

PROJECT MANAGER

INFINIGY Design. Build. Deliver.

11 Herbert Drive
Latham, NY 12110
OFFICE #: (518) 690-0790
FAX #: (518) 690-0793

ENGINEER

SCOPE OF WORK:

- HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED
- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
- FACILITY HAS NO PLUMBING OR REFRIGERANTS
- THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS
- ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. CABINETS, ANTENNAS/RRU AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR.
- INSTALL NEW ANTENNAS/RRH'S ON EXISTING TOWER
- INSTALL NEW BTS OR RETROFIT EXISTING BTS IN EXISTING EQUIPMENT AREA
- REMOVE EXISTING CDMA ANTENNAS AND COAX CABLES
- REPLACE EXISTING BATTERY CABINET WITH NEW BATTERY CABINET IF REQUIRED
- REPLACE EXISTING GPS IF REQUIRED

ENGINEER'S LICENSE

CERTIFICATION STATEMENT:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.

LICENSED ENGINEER – STATE OF CONNECTICUT

APPROVALS

ALU CONST.		DATE
ALU RF		DATE
ALU LEASING/SITE ACQ.		DATE
IN-MARKET CONSTRUCTION LEAD		DATE
SITE OWNER	NAME/COMPANY: TITLE:	DATE

INFINIGY Design. Build. Deliver.
11 Herbert Drive
Latham, NY 12110
Office # (518) 690-0790
Fax # (518) 690-0793

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

No.	Submittal / Revision	App'd	Date
2	REVISED PER COMMENTS	AHS	4/15/13
1	REVISED PER COMMENTS	AHS	3/21/13
0	ISSUED FOR REVIEW	KMF	11/14/12

Drawn: KMF Date: 11/14/12
Designed: AJD Date: 11/14/12
Checked: ASF Date: 11/14/12

Project Number: 294-038

Project Title:
EAST HARTFORD (CROWN)
CT03XC251
1455 FORBES STREET
EAST HARTFORD, CT 06118

Prepared For: Sprint VISION

Drawing Scale: AS NOTED
Date: 4/15/13

Drawing Title:
TITLE SHEET

Drawing Number:
T1

GENERAL NOTES

PART 1 – GENERAL REQUIREMENTS

1.1 THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
- A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
- B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
- C. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC").
- D. AND NFPA 101 (LIFE SAFETY CODE).
- E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM).
- F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE).

1.2 DEFINITIONS:
A: WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
B: COMPANY: SPRINT NEXTEL CORPORATION
C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
D: CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
E: THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.

1.3 POINT OF CONTACT: COMMUNICATION BETWEEN THE COMPANY AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE COMPANY SITE DEVELOPMENT SPECIALIST OR OTHER PROJECT COORDINATOR APPOINTED TO MANAGE THE PROJECT FOR THE COMPANY.

1.4 ON-SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

1.5 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES, AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.
A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.

1.6 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

1.7 NOTICE TO PROCEED:
A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED.
B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE SPRINT NEXTEL WITH AN OPERATIONAL WIRELESS FACILITY.

PART 2 – EXECUTION

2.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE, POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

2.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

2.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.

2.4 COMPANY FURNISHED MATERIAL AND EQUIPMENT: ALL HANDLING, STORAGE AND INSTALLATION OF COMPANY FURNISHED MATERIAL AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
A. CONTRACTOR SHALL PROCURE ALL OTHER REQUIRED WORK RELATED MATERIALS NOT PROVIDED BY SPRINT NEXTEL TO SUCCESSFULLY CONSTRUCT A WIRELESS FACILITY.

2.5 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

2.6 EXISTING CONDITIONS: NOTIFY THE COMPANY REPRESENTATIVE OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

PART 3 – RECEIPT OF MATERIAL & EQUIPMENT

3.1 RECEIPT OF MATERIAL AND EQUIPMENT: CONTRACTOR IS RESPONSIBLE FOR SPRINT NEXTEL PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
- A. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
- B. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
- C. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
- D. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT NEXTEL OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
- E. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
- F. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

PART 4 – GENERAL REQUIREMENTS FOR CONSTRUCTION

4.1 CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

4.2 EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.

4.3 CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
A. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
B. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.

4.4 CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION.

4.5 CONDUCT TESTING AS REQUIRED HEREIN.

PART 5 – TESTS AND INSPECTIONS

5.1 TESTS AND INSPECTIONS:
A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.

B. CONTRACTOR SHALL COORDINATE TEST AND INSPECTION SCHEDULES WITH COMPANY'S REPRESENTATIVE WHO MUST BE ON SITE TO WITNESS SUCH TESTS AND INSPECTIONS.

C. WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.

D. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
E. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.

F. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS. HYBERFLEX TESTING NOT LIMITED TO COAX SWEEPS.

G. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

PART 6 – TRENCHING AND BACKFILLING

6.1 TRENCHING AND BACKFILLING: THE CONTRACTOR SHALL PERFORM ALL EXCAVATION OF EVERY DESCRIPTION AND OF WHATEVER SUBSTANCES ENCOUNTERED, TO THE DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR AS OTHERWISE SPECIFIED.

A. PROTECTION OF EXISTING UTILITIES: THE CONTRACTOR SHALL CHECK WITH THE LOCAL UTILITIES AND THE RESPECTIVE UTILITY LOCATOR COMPANIES PRIOR TO STARTING EXCAVATION OPERATIONS IN EACH RESPECTIVE AREA TO ASCERTAIN THE LOCATIONS OF KNOWN UTILITY LINES. THE LOCATIONS, NUMBER AND TYPES OF EXISTING UTILITY LINES DETAILED ON THE CONSTRUCTION DRAWINGS ARE APPROXIMATE AND DO NOT REPRESENT EXACT INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ALL LINES DAMAGED DURING EXCAVATION AND ALL ASSOCIATED OPERATIONS. ALL UTILITY LINES UNCOVERED DURING THE EXCAVATION OPERATIONS, SHALL BE PROTECTED FROM DAMAGE DURING EXCAVATION AND ASSOCIATED OPERATIONS. ALL REPAIRS SHALL BE APPROVED BY THE UTILITY COMPANY.

B. HAND DIGGING: UNLESS APPROVED IN WRITING OTHERWISE, ALL DIGGING WITHIN AN EXISTING CELL SITE COMPOUND IS TO BE DONE BY HAND.

C. DURING EXCAVATION, MATERIAL SUITABLE FOR BACKFILLING SHALL BE STOCKPILED IN AN ORDERLY MANNER A SUFFICIENT DISTANCE FROM THE BANKS OF THE TRENCH TO AVOID OVERLOADING AND TO PREVENT SLIDES OR CAVE-INS. ALL EXCAVATED MATERIALS NOT REQUIRED OR SUITABLE FOR BACKFILL SHALL BE REMOVED AND DISPOSED OF AT THE CONTRACTOR'S EXPENSE.

D. GRADING SHALL BE DONE AS MAY BE NECESSARY TO PREVENT SURFACE WATER FROM FLOWING INTO TRENCHES OR OTHER EXCAVATIONS, AND ANY WATER ACCUMULATING THEREIN SHALL BE REMOVED BY PUMPING OR BY OTHER APPROVED METHOD.

E. SHEETING AND SHORING SHALL BE DONE AS NECESSARY FOR THE PROTECTION OF THE WORK AND FOR THE SAFETY OF PERSONNEL. UNLESS OTHERWISE INDICATED, EXCAVATION SHALL BE BY OPEN CUT, EXCEPT THAT SHORT SECTIONS OF A TRENCH MAY BE TUNNELED IF, THE CONDUIT CAN BE SAFELY AND PROPERLY INSTALLED AND BACKFILL CAN BE PROPERLY TAMPED IN SUCH TUNNEL SECTIONS. EARTH EXCAVATION SHALL COMPRISE ALL MATERIALS AND SHALL INCLUDE CLAY, SILT, SAND, MUCK, GRAVEL, HARDPAN, LOOSE SHALE, AND LOOSE STONE.

F. TRENCHES SHALL BE OF NECESSARY WIDTH FOR THE PROPER LAYING OF THE CONDUIT OR CABLE, AND THE BANKS SHALL BE AS NEARLY VERTICAL AS PRACTICABLE. THE BOTTOM OF THE TRENCHES SHALL BE ACCURATELY GRADED TO PROVIDE UNIFORM BEARING AND SUPPORT FOR EACH SECTION OF THE CONDUIT OR CABLE ON UNDISTURBED SOIL AT EVERY POINT ALONG ITS ENTIRE LENGTH. EXCEPT WHERE ROCK IS ENCOUNTERED, CARE SHALL BE TAKEN NOT TO EXCAVATE BELOW THE DEPTHS INDICATED. WHERE ROCK EXCAVATIONS ARE NECESSARY, THE ROCK SHALL BE EXCAVATED TO A MINIMUM OVER DEPTH OF 6 INCHES BELOW THE TRENCH DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR SPECIFIED. OVER DEPTHS IN THE ROCK EXCAVATION AND UNAUTHORIZED OVER DEPTHS SHALL BE THOROUGHLY BACK FILLED AND TAMPED TO THE APPROPRIATE GRADE. WHENEVER WET OR OTHERWISE UNSTABLE SOIL THAT IS INCAPABLE OF PROPERLY SUPPORTING THE CONDUIT OR CABLE IS ENCOUNTERED IN THE BOTTOM OF THE TRENCH, SUCH SOLID SHALL BE REMOVED TO A MINIMUM OVER DEPTH OF 6 INCHES AND THE TRENCH BACKFILLED TO THE PROPER GRADE WITH EARTH OF OTHER SUITABLE MATERIAL, AS HEREINAFTER SPECIFIED.

G. BACKFILLING OF TRENCHES. TRENCHES SHALL NOT BE BACKFILLED UNTIL ALL SPECIFIED TESTS HAVE BEEN PERFORMED AND ACCEPTED. WHERE COMPACTED BACKFILL IS NOT INDICATED THE TRENCHES SHALL BE CAREFULLY BACKFILLED WITH SELECT MATERIAL SUCH AS EXCAVATED SOILS THAT ARE FREE OF ICE, SNOW, ROOTS, SOD, RUBBISH OR STONES, DEPOSITED IN 6 INCH LAYERS AND THOROUGHLY AND CAREFULLY RAMMED UNTIL THE CONDUIT OR CABLE HAS A COVER OF NOT LESS THAN 1 FOOT. THE REMAINDER OF THE BACKFILL MATERIAL SHALL BE GRANULAR IN NATURE AND SHALL NOT CONTAIN ICE, SNOW ROOTS, SOD, RUBBISH, OR STONES OF 2-1/2 INCH MAXIMUM DIMENSION. BACKFILL SHALL BE CAREFULLY PLACED IN THE TRENCH AND IN 1 FOOT LAYERS AND EACH LAYER TAMPED. SETTLING THE BACKFILL WITH WATER WILL BE PERMITTED. THE SURFACE SHALL BE GRADED TO A REASONABLE UNIFORMITY AND THE MOUNDING OVER THE TRENCHES LEFT IN A UNIFORM AND NEAT CONDITION.

PROJECT INFORMATION

THIS IS AN UNMANNED AND RESTRICTED ACCESS EQUIPMENT FACILITY AND WILL BE USED FOR THE TRANSMISSION OF RADIO SIGNALS FOR THE PURPOSE OF PROVIDING PUBLIC WIRELESS COMMUNICATIONS SERVICE.

NO POTABLE WATER SUPPLY IS TO BE PROVIDED AT THIS LOCATION.

NO WASTE WATER WILL BE GENERATED AT THIS LOCATION.

NO SOLID WASTE WILL BE GENERATED AT THIS LOCATION.

SPRINT MAINTENANCE CREW (TYPICALLY ONE PERSON) WILL MAKE AN AVERAGE OF ONE TRIP PER MONTH AT ONE HOUR PER VISIT.

LEGEND

SYMBOL	DESCRIPTION
	CIRCUIT BREAKER
	NON-FUSIBLE DISCONNECT SWITCH
F	FUSIBLE DISCONNECT SWITCH
	SURFACE MOUNTED PANEL BOARD
T	TRANSFORMER
KWH	KILOWATT HOUR METER
JB	JUNCTION BOX
PB	PULL BOX TO NEC/TELCO STANDARDS
– – – – –	UNDERGROUND UTILITIES
#	DENOTES REFERENCE NOTE
■	EXOTHERMIC WELD CONNECTION
●	MECHANICAL CONNECTION
OR ⊗	GROUND ROD
OR ⊠	GROUND ROD WITH INSPECTION SLEEVE
	GROUND BAR
	PIN AND SLEEVE RECEPTACLE
	120AC DUPLEX RECEPTACLE
G	GROUND CONDUCTOR
# / #	REPRESENTS DETAIL NUMBER / REF. DRAWING NUMBER

ABBREVIATIONS

CIGBE	COAX ISOLATED GROUND BAR EXTERNAL
MIGB	MASTER ISOLATED GROUND BAR
SST	SELF SUPPORTING TOWER
GPS	GLOBAL POSITIONING SYSTEM
TYP.	TYPICAL
DWG	DRAWING
BCW	BARE COPPER WIRE
BFG	BELOW FINISH GRADE
PVC	POLYVINYL CHLORIDE
CAB	CABINET
C	CONDUIT
SS	STAINLESS STEEL
G	GROUND
AWG	AMERICAN WIRE GAUGE
RGS	RIGID GALVANIZED STEEL
AHJ	AUTHORITY HAVING JURISDICTION
TTLNA	TOWER TOP LOW NOISE AMPLIFIER
UNO	UNLESS NOTED OTHERWISE
EMT	ELECTRICAL METALLIC TUBING
AGL	ABOVE GROUND LEVEL

INFINIGY
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STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED
PROFESSIONAL ENGINEER

No	Submittal / Revision	Appd	Date
2	REVISED PER COMMENTS	AHS	4/18/13
1	REVISED PER COMMENTS	AHS	3/21/13
0	ISSUED FOR REVIEW	KMF	11/14/12

Drawn: KMF Date: 11/14/12
Designed: AJD Date: 11/14/12
Checked: JSS Date: 11/14/12

Project Number
284-038

Project Title

EAST HARTFORD (CROWN)
CT03XC251

1455 FORBES STREET
EAST HARTFORD, CT 06118

Prepared For

Sprint VISION

Drawing Scale:
AS NOTED

Date:
4/15/13

Drawing Title

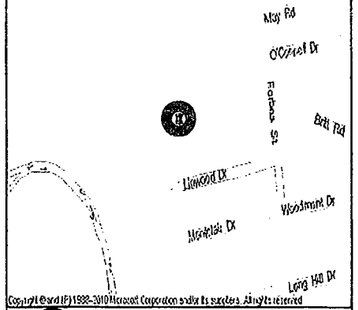
GENERAL NOTES

Drawing Number

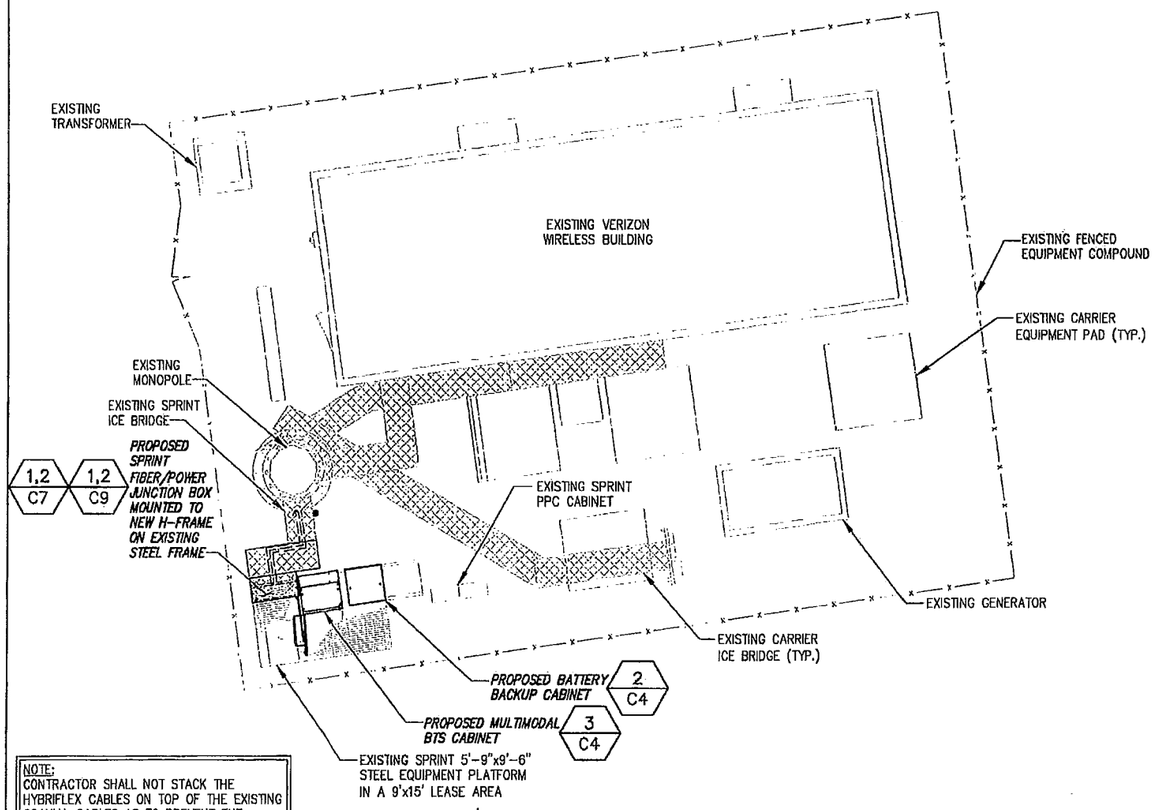
C1

INFORMATION CONTAINED WITHIN DRAWINGS ARE BASED ON PROVIDED INFORMATION.

FOR ADDITIONAL STRUCTURAL INFORMATION SEE STRUCTURAL ANALYSIS COMPLETED BY PAUL J. FORD DATED: 2/26/13.



LOCATION MAP
N.T.S.



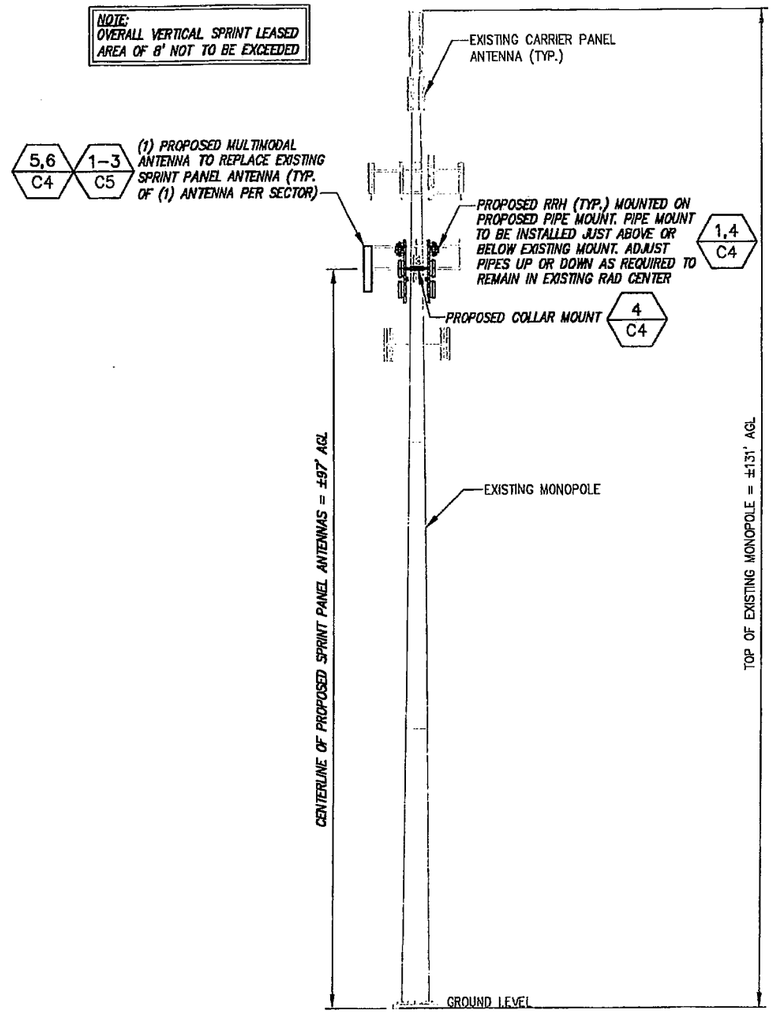
NOTE:
CONTRACTOR SHALL NOT STACK THE HYBRIFLEX CABLES ON TOP OF THE EXISTING COAXIAL CABLES AS TO PREVENT THE COAXIAL CABLES FROM BEING REMOVED.

NOTE:
1. REFER TO: CONSTRUCTION STANDARDS-SPRINT DOCUMENT: "EXHIBIT A - STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES REV 4.0 - 02.15.2011.DOCM"
2. REFER TO: "WEATHERPROOFING SPECS: EXCERPT EXH A -- WTHRPRF - STD CONSTR SPECS._15720111042185542 9.DOCM"
3. REFER TO: "COLOR CODING-SPRINT NEXTEL ANT AND LINE COLOR CODING (DRAFT) V3 09-08-11.PDF"
4. CONTRACTOR TO VERIFY LATEST REV AND DATE PRIOR TO CONSTRUCTION.

1 — COMPOUND SITE PLAN
SCALE: AS NOTED

GRAPHIC SCALE
10' 5' 0 5' 10'
SCALE (11x17): 1" = 10'-0"
SCALE (22x34): 1" = 5'-0"

NOTE:
OVERALL VERTICAL SPRINT LEASED AREA OF 8' NOT TO BE EXCEEDED



2 — SITE ELEVATION
NOT TO SCALE

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Fax # (518) 690-0793

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 21705
LICENSED PROFESSIONAL ENGINEER

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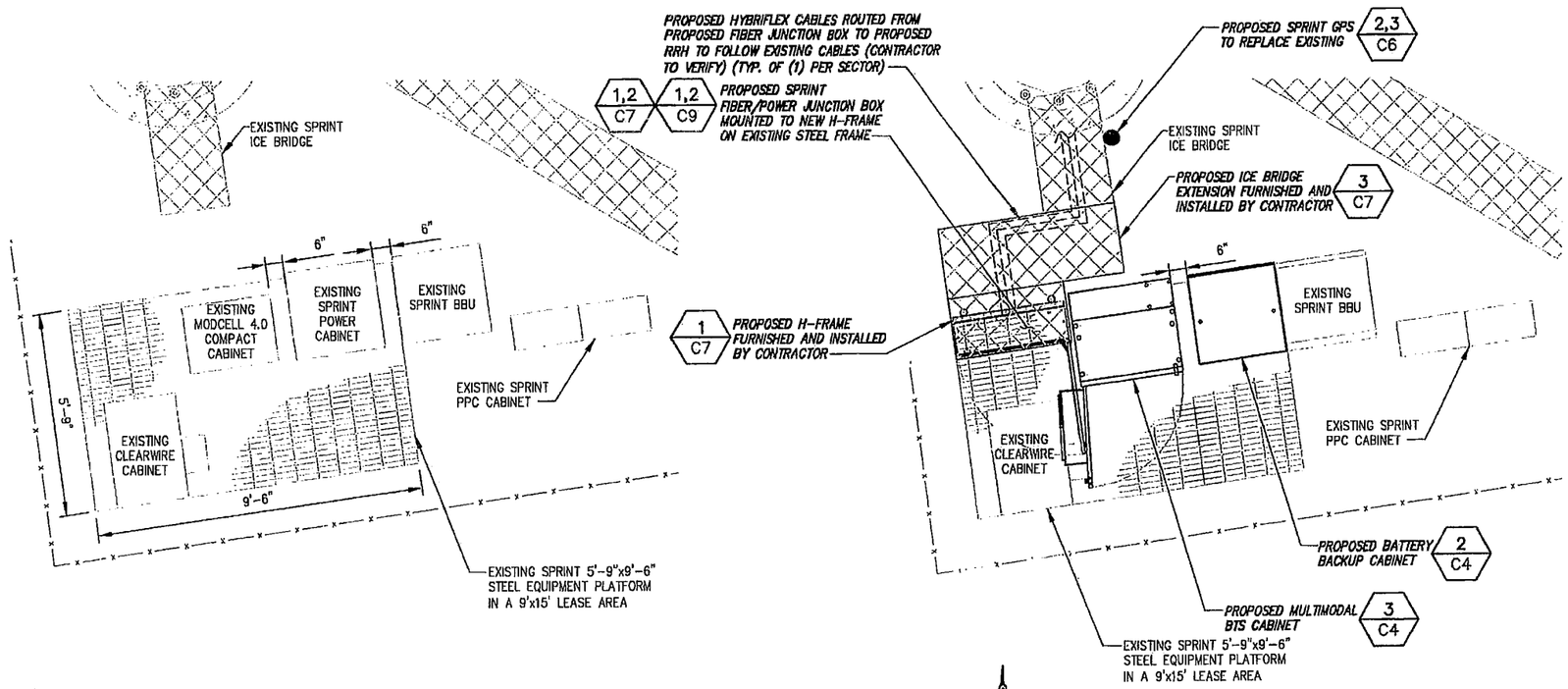
CT03XC251
1455 FORBES STREET
EAST HARTFORD, CT 06118

Prepared For
Sprint VISION

Drawing Scale: AS NOTED
Date: 4/15/13

Drawing Title
COMPOUND SITE PLAN & ELEVATION

Drawing Number
C2



CALLED NORTH

1 / -- EQUIPMENT SITE PLAN (EXISTING)
SCALE: AS NOTED

GRAPHIC SCALE
4' 2' 0 2' 4'
SCALE (11x17): 1" = 4'-0"
SCALE (22x34): 1" = 2'-0"

CALLED NORTH

2 / -- EQUIPMENT SITE PLAN (FINAL/PERMANENT)
SCALE: AS NOTED

GRAPHIC SCALE
4' 2' 0 2' 4'
SCALE (11x17): 1" = 4'-0"
SCALE (22x34): 1" = 2'-0"

NOTE:
CONTRACTOR SHALL NOT STACK THE HYBRIFLEX CABLES ON TOP OF THE EXISTING COAXIAL CABLES AS TO PREVENT THE COAXIAL CABLES FROM BEING REMOVED.

NOTE:
1. REFER TO: CONSTRUCTION STANDARDS-SPRINT DOCUMENT: "EXHIBIT A – STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES REV 4.0 – 02.15.2011.DOCM"
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3. REFER TO: "COLOR CODING-SPRINT NEXTEL ANT AND LINE COLOR CODING (DRAFT) V3 09-08-11.PDF"
4. CONTRACTOR TO VERIFY LATEST REV AND DATE PRIOR TO CONSTRUCTION.

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Sprint VISION

Drawing Scale:
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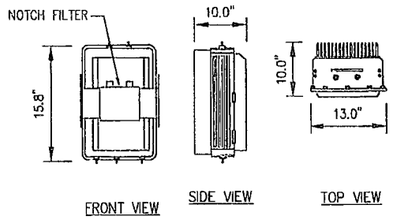
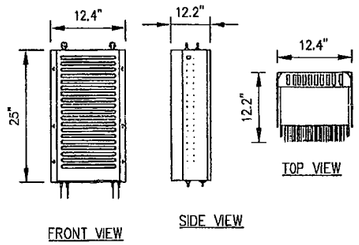
Date:
4/15/13

Drawing Title
EQUIPMENT SITE PLANS

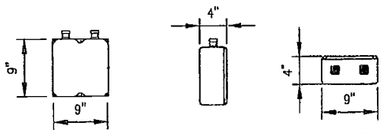
Drawing Number
C3



800 MHz RRH
(ALU)
WEIGHT = 53 LBS.



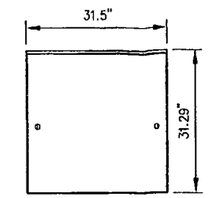
1900 MHz RRH
(ALU)
WEIGHT = 60 LBS.
(INCLUDING OPTIONAL SOLAR SHIELD)

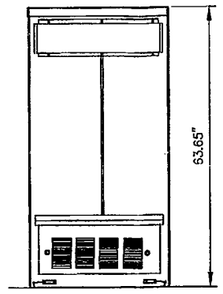


850 MHZ NOTCH FILTERS
WEIGHT = 11 LBS.

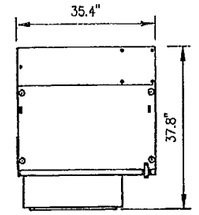
NOTE:
REFER TO R.F. SYSTEM SCHEDULE FOR EXACT RRH SPECIFICATIONS AND QUANTITIES.

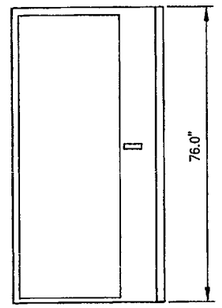
1 RRH EQUIPMENT DETAILS
NOT TO SCALE





2 BATTERY CABINET PROFILE
NOT TO SCALE



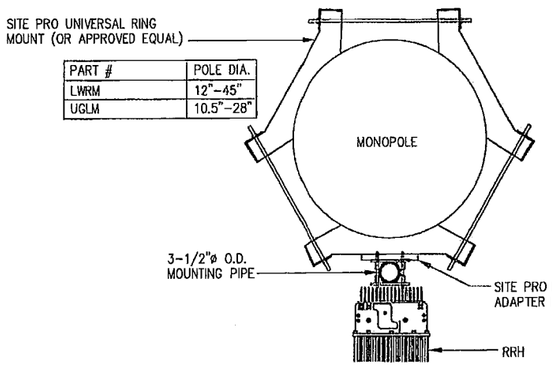


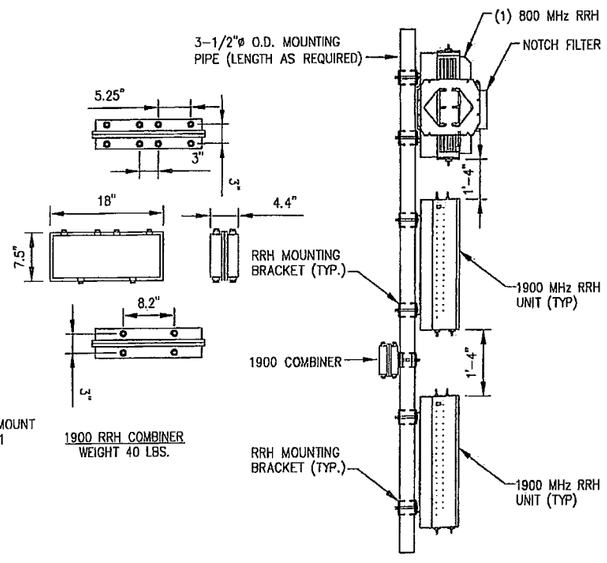
3 BTS CABINET PROFILE
NOT TO SCALE

DESIGN CRITERIA:

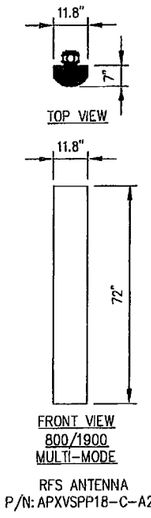
2009 INTERNATIONAL BUILDING CODE W/ STATE MODIFICATION

WIND SPEED (ASCE-7-05)	90 MPH
EXPOSURE B	
IMPORTANCE FACTOR	1.0
SEISMIC SITE CLASS	D
Ss=0.152 S1=0.050	
SEISMIC IMPORTANCE FACTOR	1.0
SEISMIC DESIGN CATEGORY	B
9928 MM BTS CABINET WEIGHT:	1074 LBS.
EMERSON BATTERY CABINET SPECIFICATIONS:	
(31.29"x31.5"x63.65")	
WEIGHTS:	
SHIPPING WEIGHT:	600 LBS.
LIFT WEIGHT:	540 LBS.
TOTAL WEIGHT:	2640 LBS (WITH BATTERIES)
INDIVIDUAL BATTERY WEIGHT:	105 LBS
(DO NOT LIFT WITH BATTERIES IN CABINET)	
MATERIAL SPECIFICATIONS	
C-, M-, AND ANGLE SHAPES:	ASTM A36
HIGH-STRENGTH BOLTS:	ASTM A325SC OR (A325N)
STRUCTURAL WF SHAPES:	ASTM A572-GR50
TUBE STEEL & PIPE COLUMNS:	ASTM A500, GRADE B
WELDING ELECTRODES:	E70XX
W - SHAPES:	ASTM A992, GRADE 50
U-BOLTS:	ASTM A36



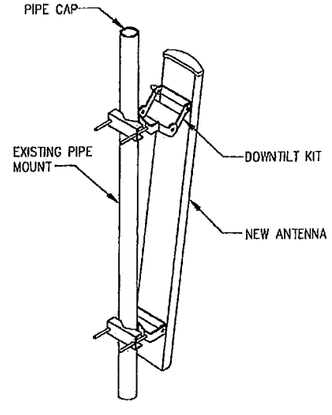


4 RRH MOUNTING DETAIL (TYP.)
NOT TO SCALE



RFS ANTENNA
P/N: APXVSPP18-C-A20

5 ANTENNA DETAILS
NOT TO SCALE



6 PANEL ANTENNA MOUNT DETAIL
NOT TO SCALE

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STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

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Checked: ACF Date: 11/14/12

Project Number
294-038

Project Title

EAST HARTFORD
(CROWN)
CT03XC251

1455 FORBES STREET
EAST HARTFORD, CT 06118

Prepared For

Sprint
VISION

Drawing Scale:
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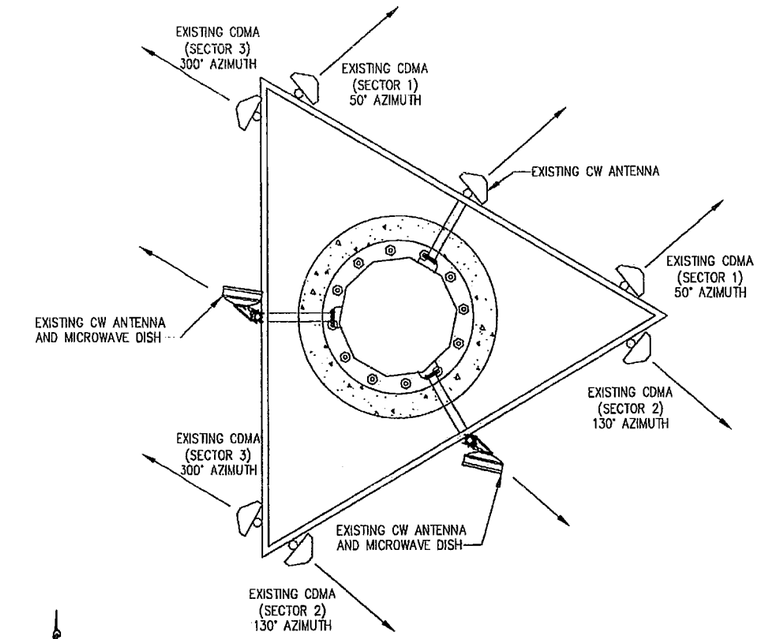
Date:
4/15/13

Drawing Title

EQUIPMENT DETAILS

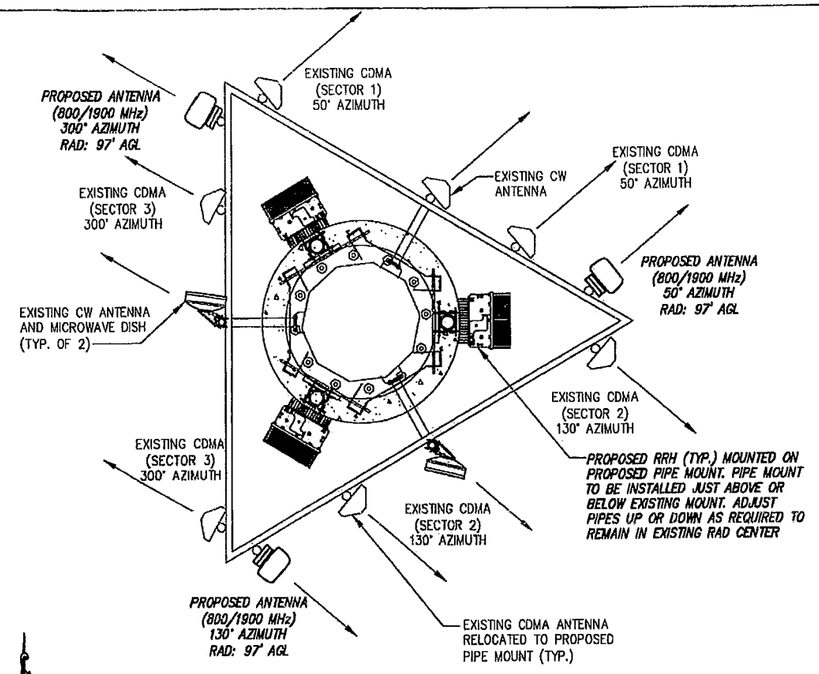
Drawing Number

C4



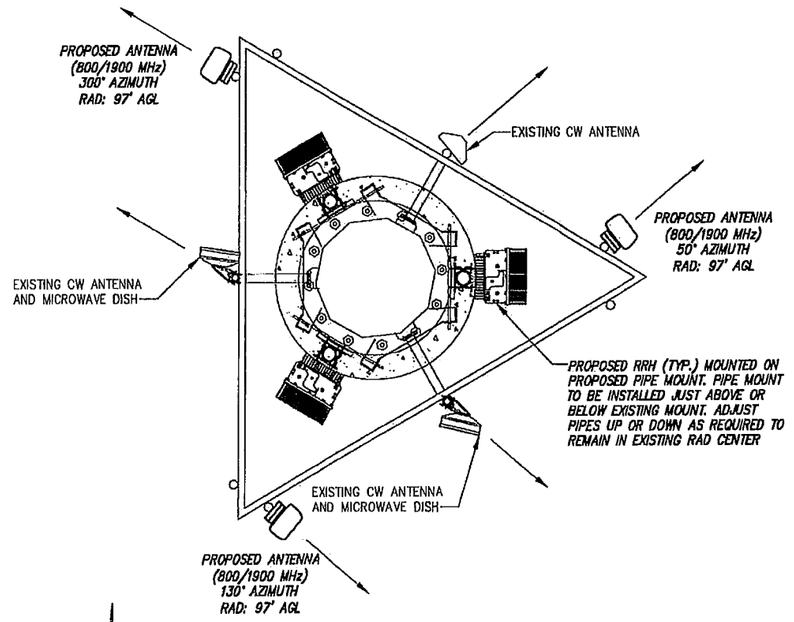
1 ANTENNA CONFIGURATION (EXISTING)
NOT TO SCALE

CALLED NORTH



2 ANTENNA CONFIGURATION (INTERIM/TEMPORARY)
NOT TO SCALE

CALLED NORTH



3 ANTENNA CONFIGURATION (FINAL/PERMANENT)
NOT TO SCALE

CALLED NORTH

NOTE:
CONTRACTOR TO VERIFY A PASSING SIGNED AND SEALED ANTENNA MOUNT/PLATFORM STRUCTURAL ANALYSIS HAS BEEN COMPLETED FOR INTERIM AND FINAL RF CONFIGURATION. NO ANTENNA MOUNT/PLATFORM MODIFICATIONS SHOULD COMMENCE OR INSTALLATION OF ANTENNAS, RRH OR TOWER MOUNTED EQUIPMENT WITHOUT VERIFYING THE MOUNT/PLATFORM ANALYSIS HAS BEEN COMPLETED FOR THE SPECIFIC LOADING. ADDITIONALLY ALL MOUNTS, ANTENNA AND COAX TO BE INSTALLED IN ACCORDANCE WITH TOWER STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE.

NOTE:
REQUIRED PIPE MOUNTS TO BE SUPPLIED BY CONTRACTOR.

FOR ADDITIONAL STRUCTURAL INFORMATION SEE STRUCTURAL ANALYSIS COMPLETED BY: PAUL J. FORD DATED: 2/26/13.

RRH NOTES:

- SEE PAGE C4 FOR RRH MOUNTING INFORMATION (TYP. ALL SECTORS).
- REFER TO RF SCHEDULE ON SHEET C8 FOR RRH UNIT SPECS AND QUANTITIES.

GENERAL NOTES:

1. NEW SPRINT PANEL ANTENNAS TO MEET RF DESIGN REQUIREMENTS PER EBTS, PER APPROVED STRUCTURAL ANALYSIS.
2. CONTRACTOR TO PROVIDE EXISTING ANTENNA VERIFICATION AND TO INCLUDE MOUNTING HEIGHT, RAD CENTER, TOP AND BOTTOM OF ANTENNAS.
3. THE CONFIGURATION PLANS ARE FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR TO VERIFY FIELD CONDITIONS.
4. THE ANTENNA INSTALLATION SHALL BE DONE IN ACCORDANCE WITH THE STRUCTURAL ANALYSIS AND ASSOCIATED DETAILS THEREIN. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO WORK ON THE STRUCTURE.
5. CONTRACTOR SHALL VERIFY NEW PARTS BEFORE ORDERING.
6. REFER TO SHEET C4 & C8 FOR ANTENNA SPECS.
7. CONTRACTOR TO USE PROPER TORQUE WHEN INSTALLING AND TIGHTENING CONNECTORS TO INSURE PROPER FIT.
8. ALL HYBRID CABLES SHALL BE MARKED WITHIN 24" OF THE END OF EACH CABLE WITH 2" WIDE VINYL TAPE. THIS INCLUDES ALL JUMPERS AND MAIN LINE HYBRID CABLES.
9. CDMA ANTENNAS SHALL NOT BE REMOVED UNTIL ALL NEW MULTI-MODE ANTENNAS ARE INSTALLED AND ON-AIR.

INFINIGY
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VISION

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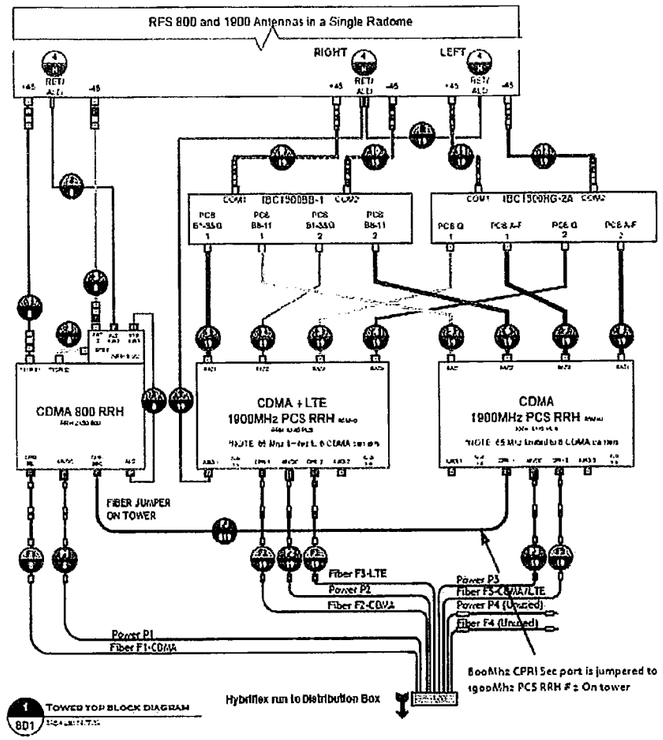
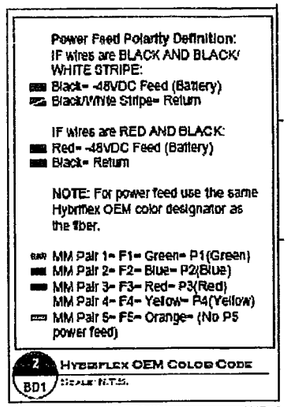
Drawing Title
ANTENNA PLANS

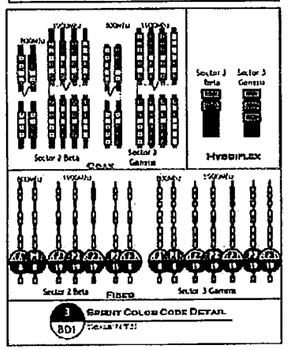
Drawing Number
C5



1 BD1 TOWER TOP BLOCK DIAGRAM
Scale: N.T.S.



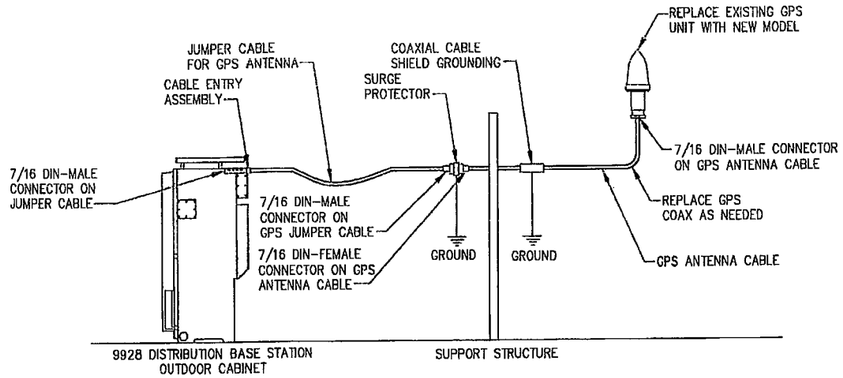
2 BD1 HYBRIFLEX OEM COLOR CODE
Scale: N.T.S.



3 BD1 SPRINT COLOR CODE DETAIL
Scale: N.T.S.

0	AISG
0	COAX
0	FIBER
0	POWER
	NOTES
0	FREQ

4 BD1 Diagram Legend
Scale: N.T.S.



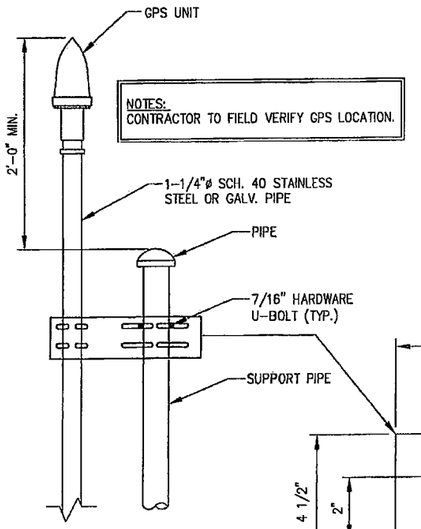
NOTE:
THE GPS SURGE NEEDS TO BE INSTALLED AWAY FROM AND SEPARATE FROM THE MMBTS CABINET (PER THE SITE PREP GUIDE)
- THE JUMPERS ARE DESIGNED TO BE INSTALLED BEFORE/AFTER THE GPS SURGE.
- THE GPS SURGE NEED TO BE CONNECTED TO THE GROUND SYSTEM, VIA A GROUND LEAD.

2 GPS UNIT DETAIL
NOT TO SCALE

SCENARIO 128 v2.3

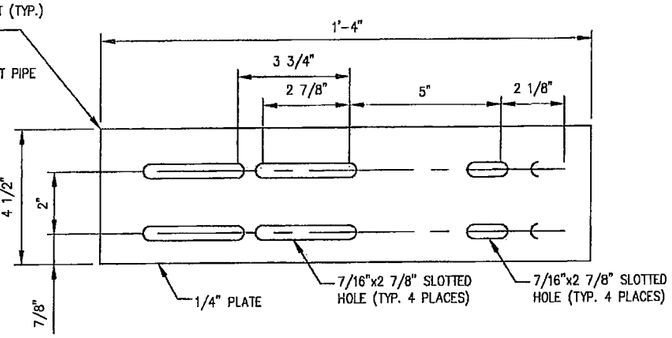
1 ANTENNA CABLE RISER DIAGRAM
NOT TO SCALE

INSTALLER VERIFY LATEST PLUMBING/WIRING DIAGRAMS, PRIOR TO INSTALLATION.



NOTES:
CONTRACTOR TO FIELD VERIFY GPS LOCATION.

GPS MINIMUM SKY VIEW REQUIREMENTS NOTES:
1. THE ELEVATION AND LOCATION OF THE GPS ANTENNA SHALL BE IN ACCORDANCE WITH THE FINAL RF REPORT.
2. THE GPS ANTENNA MOUNT IS DESIGNED TO FASTEN TO A STANDARDIZED 1-1/4" DIAMETER, SCHEDULE 40, GALVANIZED STEEL OR STAINLESS STEEL PIPE. THE PIPE SHALL BE CUT TO THE REQUIRED LENGTH USING A HAND OR ROTARY PIPE CUTTER TO ASSURE A SMOOTH AND PERPENDICULAR CUT. A HACK SAW SHALL NOT BE USED. THE CUT PIPE END SHALL BE DEBURRED AND SMOOTH IN ORDER TO SEAL AGAINST THE NEOPRENE GASKET ATTACHED TO THE ANTENNA MOUNT.
3. IT IS CRITICAL THAT THE GPS ANTENNA IS MOUNTED SUCH THAT IT IS WITHIN 2 DEGREES OF LEVEL.
4. DO NOT SWEEP TEST THE GPS ANTENNA.



3 GPS ANTENNA DETAIL
NOT TO SCALE

WEATHERPROOFING CONNECTORS AND GROUND KIT NOTES:
1. ALL CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED USING BUTYL RUBBER WEATHERPROOFING AND TAPE, THIS INSTALLATION MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION OR PER THE FOLLOWING INSTRUCTIONS (WHICHEVER IS GREATER).
2. THE COAXIAL CABLE CONNECTION OR GROUND KIT CAN BE ENCOMPASSED INTO COLD SHRINK AND COMPLETELY WRAPPED WITH 2 IN. WIDE ELECTRICAL TAPE OVERLAPPING EACH ROW BY APPROXIMATELY ½" AND EXTENDING PAST THE CONNECTION BY TWO INCHES AND DISCUSSED BELOW; OR
3. THE COAXIAL ABLE CONNECTION OR GROUND KIT CAN BE WRAPPED WITH LAYERS OR ELECTRICAL/BUTYL RUBBER/ELECTRICAL TAPE AS DISCUSSED BELOW OR;
4. THE COAXIAL CABLE CONNECTION OR GROUND KIT CAN BE WRAPPED WITH TWO LAYERS OF 1.5 INCH WIDE SELF-AMALGAMATING TAPE COVERED WITH TWO LAYERS OF ELECTRICAL TAPE.

RRH JUMPER NOTES:
1. FOR DISTANCES BETWEEN RRH'S AND ANTENNAS LESS THAN 10'-0" USE A 1/2" JUMPER.
2. FOR DISTANCES BETWEEN RRH'S AND ANTENNAS GREATER THAN 10'-0" USE A 7/8" JUMPER.

INFINIGY Design. Build. Deliver.
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No	Submittal / Revision	App'd	Date
2	REVISED PER COMMENTS	AHS	4/16/13
1	REVISED PER COMMENTS	AHS	3/21/13
0	ISSUED FOR REVIEW	KMF	11/14/12

Drawn: KMF Date: 11/14/12
Designed: AJD Date: 11/14/12
Checked: AGF Date: 11/14/12

Project Number
284-038

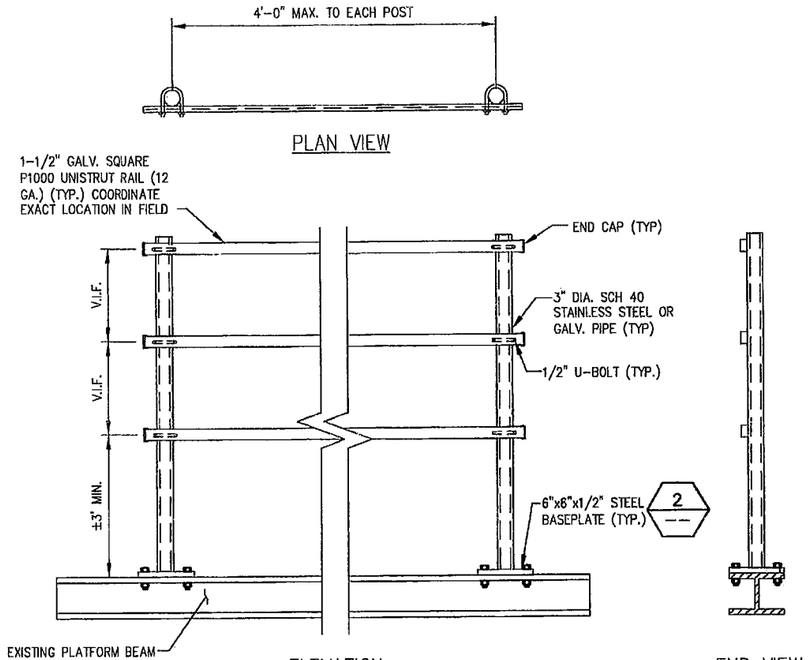
Project Title
EAST HARTFORD (CROWN)
CT03XC251
1455 FORBES STREET
EAST HARTFORD, CT 06118

Prepared For
Sprint VISION

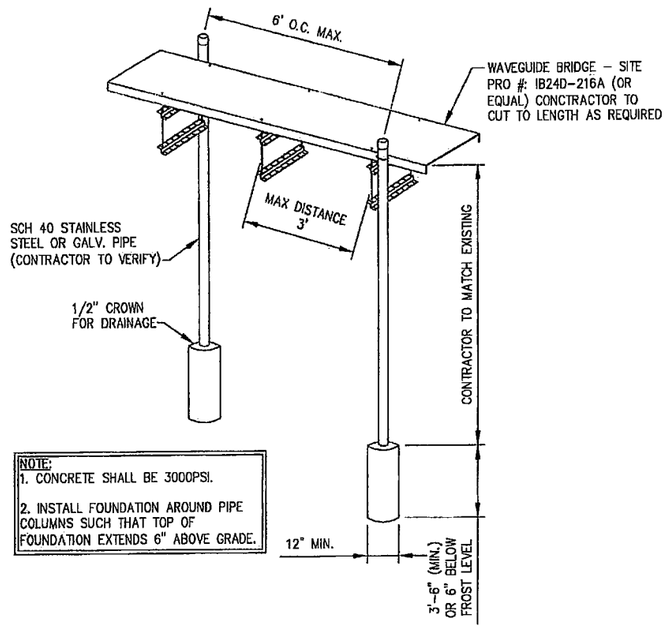
Drawing Scale:
AS NOTED
Date:
4/16/13

Drawing Title
ANTENNA CABLE RISER AND GPS DETAILS

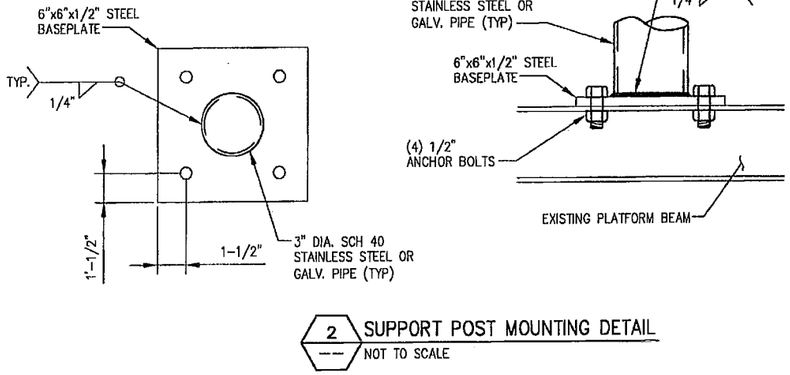
Drawing Number
C6



1 H-FRAME FABRICATION DETAIL
NOT TO SCALE



3 TYPICAL ICE BRIDGE DETAIL
NOT TO SCALE



2 SUPPORT POST MOUNTING DETAIL
NOT TO SCALE

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2	REVISED PER COMMENTS	AHS	4/15/13
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Project Title

EAST HARTFORD (CROWN)
CT03XC251

1455 FORBES STREET
EAST HARTFORD, CT 06118

Prepared For

Sprint VISION

Drawing Scale: AS NOTED
Date: 4/15/13

Drawing Title

EQUIPMENT DETAILS

Drawing Number

C7

	Market	Northern Connecticut		
	Cascade ID	CT03XC251		
		Sector 1	Sector 2	Sector 3
1900	1900MHz_Azimuth	50	130	300
	1900MHz_No_of_Antennas	1	1	1
	1900MHz_RADCenter(ft)	97	97	97
	1900MHz_Antenna Make	RFS	RFS	RFS
	1900MHz_Antenna Model	APXVSPP18-C-A20	APXVSPP18-C-A20	APXVSPP18-C-A20
	1900MHz_Horizontal_Beamwidth	65	65	65
	1900MHz_Vertical_Beamwidth	5.5	5.5	5.5
	1900MHz_AntennaHeight (ft)	6	6	6
	1900MHz_AntennaGain(dBd)	15.9	15.9	15.9
	1900MHz_E_Tilt	0	0	-1
	1900MHz_M_Tilt	0	0	0
	1900_Effective_Tilt	0	0	-1
	1900MHz_Carrier_Forecast_Year_2013	6	6	6
	1900MHz_RRH Manufacturer	ALU	ALU	ALU
	1900MHz_RRH Model	RRH 1900 4X45 65MHz	RRH 1900 4X45 65MHz	RRH 1900 4X45 65MHz
	1900MHz_RRH Count	1	1	1
	1900MHz_RRH Location	Top of the Pole/Tower	Top of the Pole/Tower	Top of the Pole/Tower
	1900MHz Combiner Model	No Combiner Required	No Combiner Required	No Combiner Required
	1900MHz Power Split Ratio (Main/Split)			
	1900MHz Splitter Manufacturer			
	1900MHz Splitter Model			
	1900MHz Number of Splitters			
	1900MHz_Top_Jumper #1_Length (RRH or Combiner-to-Antenna for TT or Main Coax to Antenna for Ground Mount, ft)	10	10	10
	1900MHz_Top_Jumper #1_Cable_Model (RRH or Combiner-to-Antenna for TT or Main Coax to Antenna for Ground Mour	LCF12-50J	LCF12-50J	LCF12-50J
	1900MHz_Top_Jumper #2_Length (RRH to Combiner for TT if applicable, ft)	N/A	N/A	N/A
	1900MHz_Top_Jumper #2_Cable_Model (RRH to Combiner for TT if applicable)	N/A	N/A	N/A
	1900MHz_Main_Coax_Cable_Length (ft)	N/A	N/A	N/A
	1900MHz_Main_Coax_Cable_Model	N/A	N/A	N/A
	1900MHz_Bottom_Jumper #1_Length (Ground based RRH to Combiner-OR-Main Coax, ft)	N/A	N/A	N/A
	1900MHz_Bottom_Jumper #1_Cable_Model (Ground based RRH to Combiner-OR-Main Coax)	N/A	N/A	N/A
	1900MHz_Bottom_Jumper #2_Length (Ground based-Combiner to Main Coax, ft)	N/A	N/A	N/A
	1900MHz_Bottom_Jumper #2_Cable_Model (Ground based-Combiner to Main Coax)	N/A	N/A	N/A
800	800MHz_Azimuth	50	130	300
	800MHz_No_of_Antennas	0	0	0
	800MHz_RADCenter(ft)	97	97	97
	800MHz_AntennaMake	RFS	RFS	RFS
	800MHz_AntennaModel	APXVSPP18-C-A20 (Shared w/1900)	APXVSPP18-C-A20 (Shared w/1900)	APXVSPP18-C-A20 (Shared w/1900)
	800MHz_Horizontal_Beamwidth	65	65	65
	800MHz_Vertical_Beamwidth	11.5	11.5	11.5
	800MHz_AntennaHeight (ft)	6	6	6
	800MHz_AntennaGain (dBd)	13.4	13.4	13.4
	800MHz_E_Tilt	0	-8	-2
	800MHz_M_Tilt	0	0	0
	800 MHz_Effective Tilt (degrees)	0	-8	-2
	800MHz_RRH Manufacturer	ALU	ALU	ALU
	800_Combiner_Model	N/A	N/A	N/A
	800MHz_RRH Model	800 MHz RRH 2x50W	800 MHz RRH 2x50W	800 MHz RRH 2x50W
	800MHz_RRH Count	1	1	1
	800MHz_RRH Location	Top of the Pole/Tower	Top of the Pole/Tower	Top of the Pole/Tower
	800MHz Power Split Ratio (Main/Split)			
	800MHz Splitter Manufacturer			
	800MHz Splitter Model			
	800MHz Number of Splitters	0	0	0
	800_Top_Jumper #1_Length (RRH to Antenna for TT or Main Coax to Antenna for GM)	10	10	10
	800_Top_Jumper_Cable_Model (RRH to Antenna for TT or Main Coax to Antenna for GM)	LCF12-50J	LCF12-50J	LCF12-50J
	800MHz_Main_Coax_Cable_Length (ft)	N/A	N/A	N/A
	800MHz Main Coax Cable Model	N/A	N/A	N/A
	800_Bottom_Jumper #1_Length (Ground based RRH to Main Coax)	N/A	N/A	N/A
	800_Bottom_Jumper #1_Cable_Model (Ground based RRH to Main Coax)	N/A	N/A	N/A
	Plumbing Scenario *	124	124	124
Comments	* If plumbing scenario does not match the material received, please contact your Construction Manager TT6 Jumper With 800 with LTE 2/5/2013			

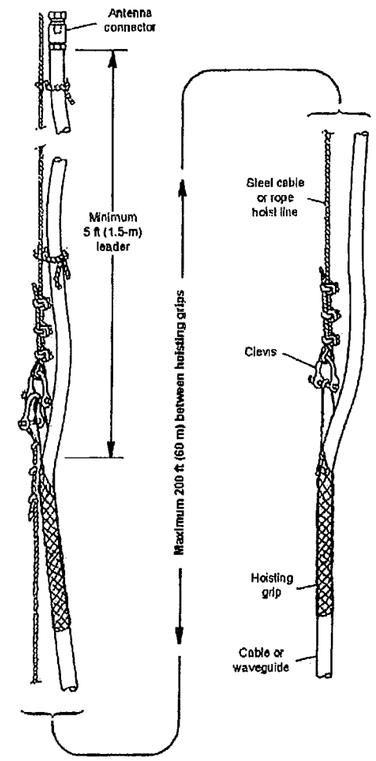
NOTE:
RFDS SHOWN PROVIDED BY SPRINT DATED 2/5/13.

NOTE:
COORDINATE RF ANTENNA INSTALLATION WITH FINAL SPRINT RFDS. COORDINATE RF MW DISH (IF APPLICABLE) INSTALLATION WITH FINAL SPRINT RFDS.

1 SPRINT RFDS
NOT TO SCALE

CHECK FST FOR LATEST VERSION OF RFDS

1. DO NOT USE ONE HOISTING GRIP FOR HOISTING TWO OR MORE CABLES OR CABLE TRAYS. THIS CAN CAUSE THE HOISTING GRIP TO BREAK OR THE CABLES OR WAVE- GUIDES TO FALL.
2. DO NOT USE THE HOISTING GRIP FOR LOWERING CABLE OR CABLE TRAY. SNAGGING OF THE CABLE OR CABLE TRAY MAY LOOSEN THE GRIP AND POSSIBLY CAUSE THE CABLE TO CABLE TRAY TO SWAY OR FALL.
3. DO NOT REUSE HOISTING GRIPS. USED GRIPS MAY HAVE LOST ELASTICITY, STRETCHED, OR BECOME WEAKENED. REUSING A GRIP CAN CAUSE THE CABLE OR CABLE TRAY TO SLIP, BREAK, OR FALL.
4. USE HOISTING GRIPS AT INTERVALS OF NO MORE THAN 200 FT (60 M).
5. MAKE SURE THAT THE PROPER HOISTING GRIP IS USED FOR THE CABLE OR CABLE TRAY BEING INSTALLED. SLIPPAGE OR INSUFFICIENT GRIPPING STRENGTH WILL RESULT IF YOU ARE USING THE WRONG HOISTING GRIP.



2 HOIST GRIP DETAIL
NOT TO SCALE

NOTE:
1. REFER TO: CONSTRUCTION STANDARDS--SPRINT DOCUMENT: "EXHIBIT A – STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES REV 4.0 – 02.15.2011.DOCM"
2. REFER TO: "WEATHERPROOFING SPECS: EXCERPT EXH A – WTHRPRF – STD CONSTR SPECS._157201110421855429.DOCM"
3. REFER TO: "COLOR CODING–SPRINT NEXTEL ANT AND LINE COLOR CODING (DRAFT) V3 09-08-11.PDF"
4. CONTRACTOR TO VERIFY LATEST REV AND DATE PRIOR TO CONSTRUCTION.

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284-038

Project Title

EAST HARTFORD
(CROWN)
CT03XC251

1455 FORBES STREET
EAST HARTFORD, CT 06118

Prepared For

Sprint VISION

Drawing Scale:
AS NOTED

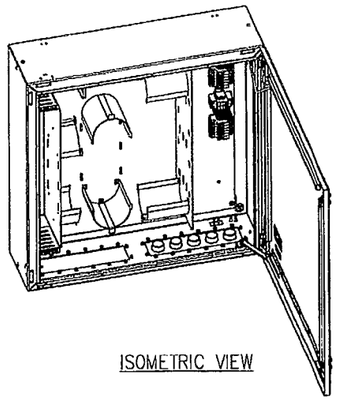
Date:
4/15/13

Drawing Title

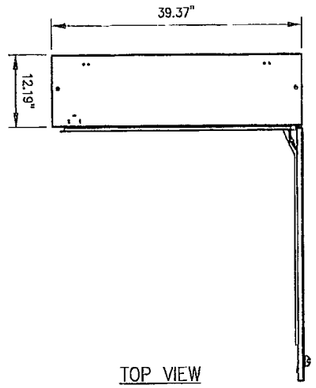
RF AND CABLE DETAILS

Drawing Number

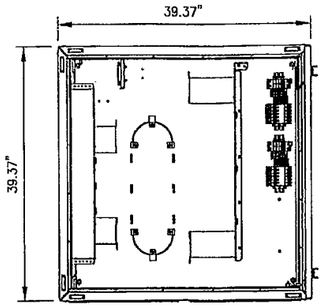
C8



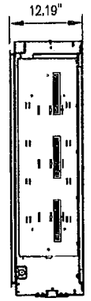
ISOMETRIC VIEW



TOP VIEW

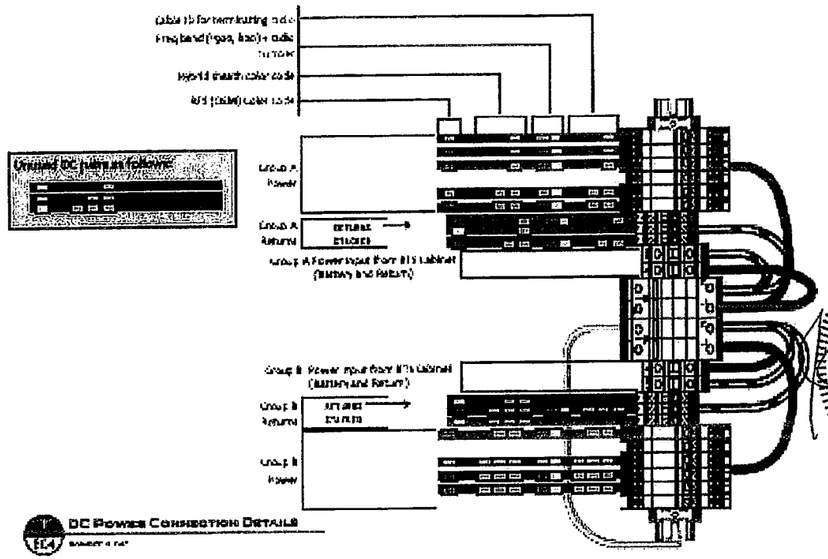


FRONT VIEW

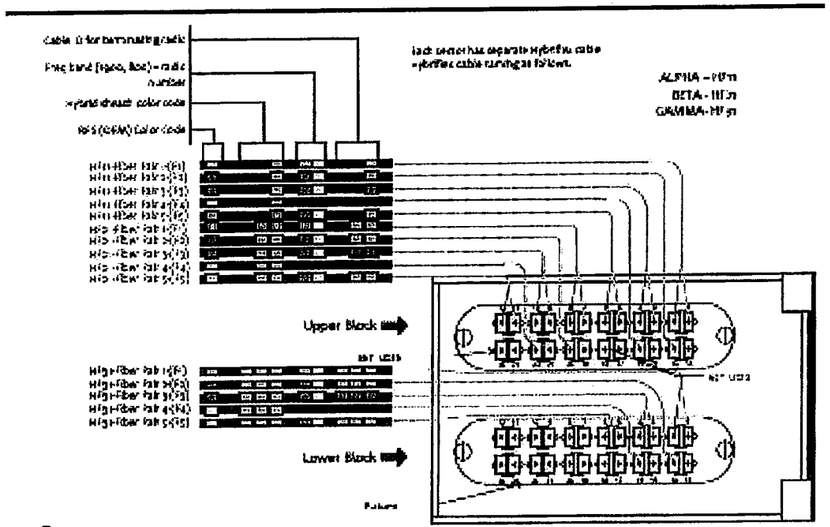


SIDE VIEW

1 DISTRIBUTION BOX DETAIL
NOT TO SCALE



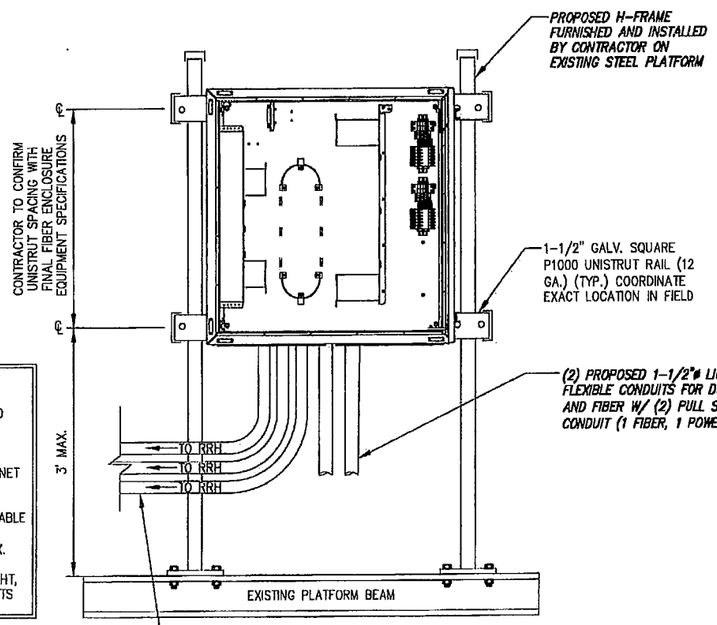
DC Power Connection Details



2 Fiber Connection Details

SCENARIO 128 v2.3

3 FIBER & DC CONNECTION DETAILS
NOT TO SCALE



NOTE:
- DISTRIBUTION BOX IS KITTED WITH 50' OF 1-1/2" LIQUID-TIGHT CONDUIT AND CONNECTORS. THIS SHOULD BE:
* SPLIT IN HALF,
* TERMINATED TO THE DISTRIBUTION BOX AS SHOWN,
* RAN TO AND COILED AS CLOSE TO WHERE THE CABINET IS GOING TO BE MOUNTED AS POSSIBLE.

- DISTRIBUTION BOX IS KITTED WITH 2 AWG, POWER CABLE 35' x 2EA. RUNS RED AND 2EA. RUNS BLACK. THIS SHOULD BE COILED AND LEFT INSIDE DISTRIBUTION BOX.

- BTS INSTALLATION TEAM WILL TERMINATE LIQUID-TIGHT, RUN THE FIBER JUMPERS AND POWER CABLES FROM BTS CABINET TO DISTRIBUTION BOX.

NOTE:
1. ANCHORS AND UNISTRUT CHANNEL SHALL HAVE HOT-DIPPED GALVANIZED FINISH.
2. MOUNT FIBER AND POWER DISTRIBUTION BOX WITH FOUR (4) 1/4"ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS.

2 TYPICAL DISTRIBUTION BOX ON H-FRAME DETAIL
NOT TO SCALE

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CT03XC251

1455 FORBES STREET
EAST HARTFORD, CT 06118

Prepared For
Sprint VISION

Drawing Scale:
AS NOTED

Date:
4/15/13

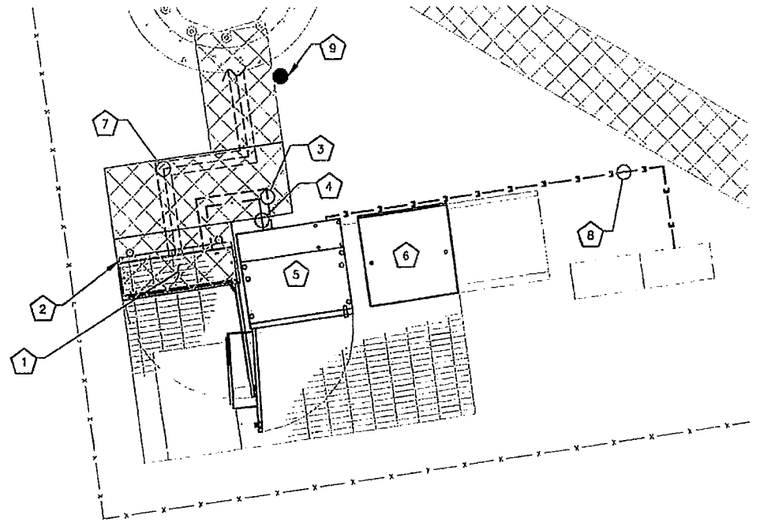
Drawing Title
FIBER DISTRIBUTION BOX DETAILS

Drawing Number
C9

CODED NOTES:

1. PROPOSED SPRINT FIBER/POWER JUNCTION BOX MOUNTED TO NEW H-FRAME
2. PROPOSED H-FRAME FURNISHED AND INSTALLED BY CONTRACTOR
3. PROPOSED 1-1/2" LIQUID TIGHT CONDUIT WITH PULL-STRING FOR TELCO FROM FIBER JUNCTION BOX TO RADIO EQUIPMENT CABINET, 3'
4. PROPOSED 1-1/2" LIQUID TIGHT CONDUIT WITH PULL-STRING FOR DC POWER FROM FIBER JUNCTION BOX TO RADIO EQUIPMENT CABINET, 3'
5. PROPOSED MULTIMODAL BTS CABINET
6. PROPOSED BATTERY BACKUP CABINET
7. PROPOSED HYBRIFLEX CABLES ROUTED FROM PROPOSED FIBER JUNCTION BOX TO PROPOSED RRH TO FOLLOW EXISTING CABLES (CONTRACTOR TO VERIFY) (TYP. OF (1) PER SECTOR)
8. PROPOSED 2"ø LIQUID TIGHT CONDUIT ROUTED FROM BTS TO EXISTING PPC CABINET
9. PROPOSED SPRINT GPS TO REPLACE EXISTING

NOTE:
CONTRACTOR SHALL NOT STACK THE HYBRIFLEX CABLES ON TOP OF THE EXISTING COAXIAL CABLES AS TO PREVENT THE COAXIAL CABLES FROM BEING REMOVED.



CALLED NORTH

1 — UTILITY SITE PLAN
SCALE: AS NOTED

GRAPHIC SCALE
4' 2' 0 2' 4'
SCALE (11x17): 1" = 4'-0"
SCALE (22x34): 1" = 2'-0"

UNDERGROUND SERVICE ALERT
CALL TOLL FREE
1-800-922-4455
THREE WORKING DAYS BEFORE YOU DIG

NOTES:
- CONTRACTOR TO USE EXISTING SPARE CONDUITS, IF AVAILABLE. CONDUIT SIZES MUST BE EQUAL TO OR GREATER THAN THAT ALLOWED BY CODE.
- EXISTING ALARMS NEED TO BE RE-ROUTED AND VERIFIED IN PROPER WORKING CONDITION WHEN NEW MMBTS EQUIPMENT IS INSTALLED.
- REMAINING GROUND LEADS FROM REMOVED CABINETS TO BE COILED (NOT ON WALKING SURFACE).
- REMAINING UNUSED CONDUITS FROM EXISTING CABINETS TO BE COVERED WITH WATERPROOF CAPS (NOT DUCT TAPE).

EXISTING PANELBOARD

PANEL RATING: 120/240V, 60 HZ, 1ø, 100A

BUS AMPS L1	BUS AMPS L2	LOAD	POLES	AMPS	BUS L1	BUS L2	AMPS	POLES	LOAD	BUS AMPS L1	BUS AMPS L2
		NOT LABELED	2	---	1	7	---	2	NOT LABELED		
					2	8					
		CLEARWIRE	2	---	3	9	---	2	NOT LABELED		
					4	10					
		NOT LABELED	1	---	5	11	---	1	NOT LABELED		
		NOT LABELED	1	---	6	12	---	2	NOT USED		

NOTE:
CONTRACTOR IS TO ENSURE THE INSTALLATION INSTRUCTIONS FOR EACH CABINET ARE FOLLOWED AND THAT THE MANUFACTURER'S REQUIREMENTS ARE MET.

2 — EXISTING PANELBOARD SCHEDULE
NOT TO SCALE

NOTE:
THERE ARE NO EXISTING DUAL POLE BREAKER POSITIONS AVAILABLE FOR THE MM BTS BREAKER. CONTRACTOR TO VERIFY IF THERE ARE EXISTING SPARE OR UNUSED BREAKERS INSIDE THE PANEL AND REPLACE WITH THE NEW 2P 60A BREAKER FOR THE MM BTS CABINET.

ELECTRICAL NOTES:

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (N.E.C.), AND APPLICABLE LOCAL CODES
2. GROUNDING SHALL COMPLY WITH THE ARTICLE 250 OF NATIONAL ELECTRICAL CODE.
3. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED.
4. ALL WIRES SHALL BE AWG MIN #12 THHN COPPER UNLESS NOTED.
5. CONDUCTORS SHALL BE INSTALLED IN SCHEDULE 40 PVC CONDUIT UNLESS NOTED OTHERWISE.
6. LABEL SPRINT SERVICE DISCONNECTS WITH SWITCH AND PPC CABINET WITH ENGRAVED LAMACOID LABELS, LETTERS 1" IN HEIGHT.
7. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE. BEND GROUNDING LEADS WITH A MINIMUM 8" RADIUS.
8. ENGAGE AN INDEPENDENT TESTING FIRM TO TEST AND VERIFY THAT RESISTANCE DOES NOT EXCEED 10 OHMS TO GROUND. TEST GROUND RING RESISTANCE PRIOR TO MAKING FINAL GROUND CONNECTIONS TO INFRASTRUCTURE AND EQUIPMENT. GROUNDING AND OTHER OPERATIONAL TESTING SHALL BE WITNESSED BY SPRINTS REPRESENTATIVE.
9. PROVIDE PULL BOXES AND JUNCTION BOXES WHERE REQUIRED SO THAT CONDUIT BENDS DO NOT EXCEED 360 DEGREES.
10. OBTAIN PERMITS AND PAY FEES RELATED TO ELECTRICAL WORK PERFORMED ON THIS PROJECT. DELIVER COPIES OF ALL PERMITS TO SPRINT REPRESENTATIVE.
11. SCHEDULE AND ATTEND INSPECTIONS RELATED TO ELECTRICAL WORK REQUIRED BY JURISDICTION HAVING AUTHORITY. CORRECT AND PAY FOR ANY WORK REQUIRED TO PASS ANY FAILED INSPECTION.
12. REDLINED AS-BUILTS ARE TO BE DELIVERED TO A SPRINT REPRESENTATIVE.
13. PROVIDE TWO COPIES OF OPERATION AND MAINTENANCE MANUALS IN THREE-RING BINDER.
14. FURNISH AND INSTALL THE COMPLETE ELECTRICAL SERVICE, TELCO CONDUIT, AND THE COMPLETE GROUNDING SYSTEM.
15. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH ALL APPLICABLE BUILDING CODES AND LOCAL ORDINANCES, INSTALLED IN A NEAT MANNER AND SHALL BE SUBJECT TO APPROVAL BY A SPRINT REPRESENTATIVE.
16. CONDUCT A PRE-CONSTRUCTION SITE VISIT AND VERIFY EXISTING SITE CONDITIONS AFFECTING THIS WORK. REPORT ANY OMISSIONS OR DISCREPANCIES FOR CLARIFICATION PRIOR TO THE START OF CONSTRUCTION.
17. PROTECT ADJACENT STRUCTURES AND FINISHES FROM DAMAGE, REPAIR TO ORIGINAL CONDITION ANY DAMAGED AREA.
18. REMOVE DEBRIS ON A DAILY BASIS. DEBRIS NOT REMOVED IN A TIMELY FASHION WILL BE REMOVED BY OTHERS AND THE RESPONSIBLE SUBCONTRACTOR SHALL BE CHARGED ACCORDINGLY. REMOVAL OF DEBRIS SHALL BE COORDINATED WITH THE OWNER'S REPRESENTATIVE. DEBRIS SHALL BE REMOVED FROM THE PROPERTY AND DISPOSED OF LEGALLY.
19. UPON COMPLETION OF WORK, THE SITE SHALL BE CLEAN AND FREE OF DUST AND FINGERPRINTS.
20. PRIOR TO ANY TRENCHING, CONTACT LOCAL UTILITY TO VERIFY LOCATION OF ANY EXISTING BURIED SERVICE CONDUITS.
21. DOCUMENT GROUND RING INSTALLATION AND CONNECTIONS TO IT WITH PHOTOGRAPHS PRIOR TO BACKFILLING SITE. PRESENT PHOTO ARCHIVE A SITE "PUNCH LIST" WALK TO SPRINT'S REPRESENTATIVE.

NOTE:
INFINIGY ENGINEERING HAS NOT CONDUCTED AN ELECTRICAL LOAD STUDY FOR THIS SITE. CONTRACTOR IS TO VERIFY EXISTING ELECTRICAL LOADS PRIOR TO CONSTRUCTION TO ENSURE THERE IS AMPLE SERVICE AVAILABLE TO ACCOMMODATE THE EXISTING AND PROPOSED EQUIPMENT.

INFINIGY
Design. Build. Deliver.
11 Herbert Drive
Latham, NY 12110
Office # (518) 690-0790
Fax # (518) 690-0793

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

No	Submitted / Revision	App'd	Date
2	REVISED PER COMMENTS	ANS	4/15/13
1	REVISED PER COMMENTS	ANS	3/21/13
0	ISSUED FOR REVIEW	KMF	11/14/12

Drawn: KMF Date: 11/14/12
Designed: AJD Date: 11/14/12
Checked: AGF Date: 11/14/12

Project Number
284-038

Project Title

EAST HARTFORD
(CROWN)
CT03XC251

1455 FORBES STREET
EAST HARTFORD, CT 06118

Prepared For

Sprint VISION

Drawing Scale:
AS NOTED

Date:
4/15/13

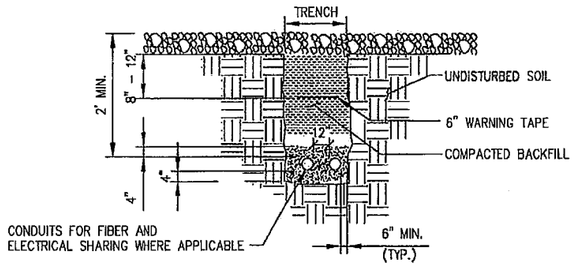
Drawing Title

UTILITY SITE PLAN

Drawing Number

E1

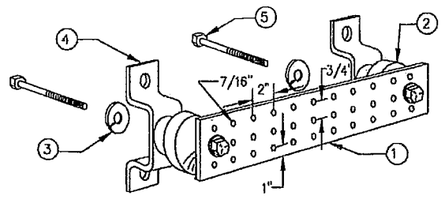
GROUNDING NOTES:
IN ADDITION TO POWER SERVICE GROUNDING AS REQUIRED BY NEC. CONTRACTOR SHALL BE RESPONSIBLE TO COORD AND INSTALL ALL SURGE AND LIGHTING PROTECTION GROUNDING AS REQUIRED AND SPECIFIED BY SPRINT.



– SEPARATION DIMENSIONS MUST BE VERIFIED WITH LOCAL UTILITY CO. REQUIREMENTS.

*HAND DIG INSIDE COMPOUND

1 UTILITY TRENCH DETAIL
NOT TO SCALE

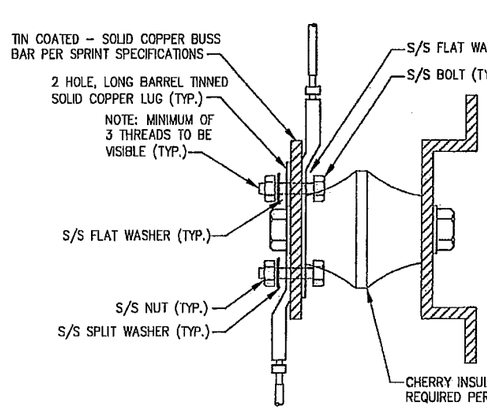


LEGEND

1. TINNED COPPER GROUND BAR, 1/4"x4"x20", NEWTON INSTRUMENT CO., HARGER TGBI1442OM, OR EQUIVALENT. HOLE CENTERS TO MATCH
2. NEMA DOUBLE LUG CONFIGURATION.
3. INSULATORS, NEWTON INSTRUMENT CO. CAT. NO. 3061–4 OR HARGER EQUIVALENT.
4. 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015–8 OR EQUIVALENT.
5. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT. NO. A–6056 OR HARGER EQUIVALENT.
6. 5/8–11"x1" H.H.C.S. BOLTS, NEWTON INSTRUMENT CO. CAT. NO. 3012–1 OR HARGER EQUIVALENT.

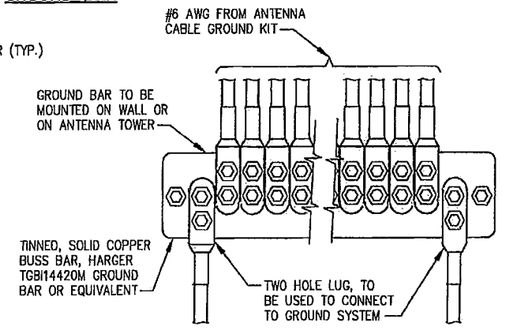
NOTE:
1) ALL MOUNTING HARDWARE CAN ALSO BE USED ON 6", 12", 18", ETC. GROUND BARS.
2) ENTIRE ESSEMBLY AVAILABLE FROM NEWTON INSTRUMENT CO. CAT. NO. 2106060010 OR AS HARGER TGBI14420M.

GROUND BAR



NOTE:
1) ALL HARDWARE 18–8 STAINLESS STEEL INCLUDING SPLIT WASHERS.
2) COAT WIRE END WITH ANTI–OXIDATION COMPOUND PRIOR TO INSERTION INTO LUG BARREL AND CRIMPING.
3) APPLY ANTI–OXIDATION COMPOUND BETWEEN ALL LUGS AND BUSS BARS PRIOR TO MATING AND BOLTING.

GROUND LUG



NOTE:
CONTRACTOR TO UTILIZE KORP–SHIELD (THOMAS & BETTS) OR EQUIVALENT ON ALL LUG CONNECTIONS

ANTENNA GROUND BAR

2 GROUND BAR DETAILS
NOT TO SCALE

INFINIGY
Design. Build. Deliver.
11 Herbert Drive
Latham, NY 12110
Office # (516) 690-0790
Fax # (516) 690-0793

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

No	Submittal / Revision	App'd	Date
2	REVISED PER COMMENTS	AHS	4/15/13
1	REVISED PER COMMENTS	AHS	3/21/13
0	ISSUED FOR REVIEW	KMF	11/14/12

Drawn: KMF Date: 11/14/12
Designed: AJD Date: 11/14/12
Checked: ASF Date: 11/14/12

Project Number
294-038

Project Title

EAST HARTFORD (CROWN)
CT03XC251

1455 FORBES STREET
EAST HARTFORD, CT 06118

Prepared For

Sprint VISION

Drawing Scale:
AS NOTED

Date:
4/15/13

Drawing Title

DETAILS

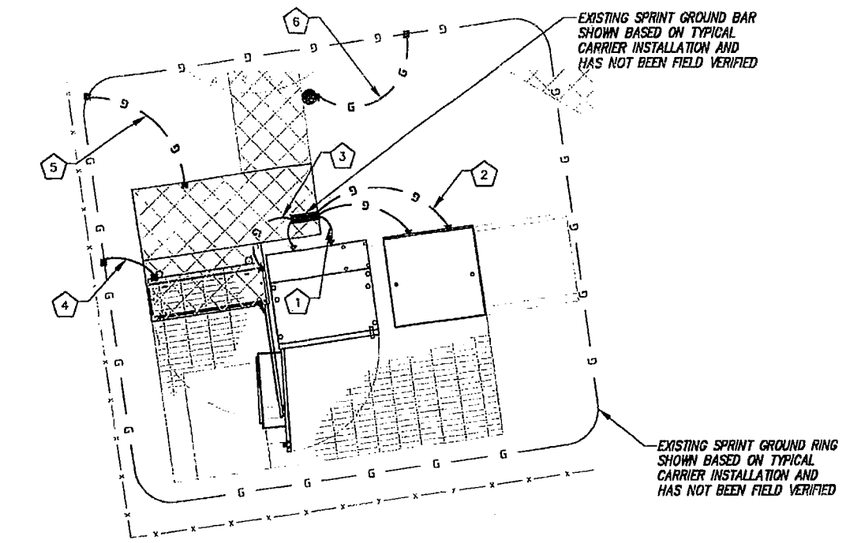
Drawing Number

E2

CODED NOTES:

1. *PROPOSED MULTIMODAL BTS CABINET*
2. *PROPOSED BATTERY BACKUP CABINET*
3. *PROPOSED SPRINT FIBER/POWER JUNCTION BOX MOUNTED TO NEW H-FRAME*
4. *PROPOSED H-FRAME FURNISHED AND INSTALLED BY CONTRACTOR*
5. *PROPOSED ICE BRIDGE EXTENSION FURNISHED AND INSTALLED BY CONTRACTOR*
6. *PROPOSED SPRINT GPS TO REPLACE EXISTING*

SYMBOL	
⊗	COPPER GROUND ROD
▸	CONNECT PER MANUFACTURER SPECS
▪	CADWELD CONNECTION
▫	MECHANICAL CONNECTION
	GROUND BAR



CALLED NORTH

1 EQUIPMENT GROUNDING PLAN
SCALE: AS NOTED

GRAPHIC SCALE

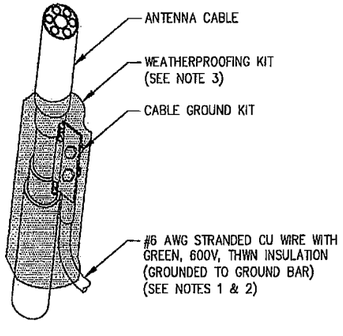
4' 2' 0 2' 4'

SCALE (11x17): 1" = 4'-0"
SCALE (22x34): 1" = 2'-0"

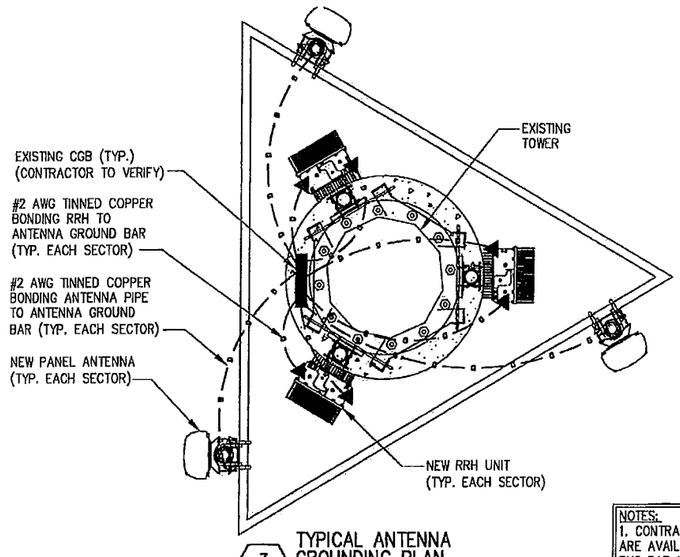
GROUNDING NOTES:

1. ALL DOWN CONDUCTORS AND GROUND RING AND CONDUCTOR SHALL BE #2 AWG, SOLID, BARE, TINNED COPPER, UNO. ALL CONNECTIONS TO GROUND RING SHALL BE EXOTHERMICALLY WELDED. CONDUCTOR SHALL BE A MINIMUM DEPTH BELOW GRADE OF 30 INCHES OR TO THE LEDGE. MINIMUM BEND RADIUS SHALL BE 8 INCHES. CONDUCTOR SHALL BE AT LEAST 24 INCHES FROM ANY FOUNDATION, UNO.
2. WHERE MECHANICAL CONDUCTOR CONNECTIONS ARE SPECIFIED, BOLTED, COMPRESSION-TYPE CLAMPS OR SPLIT-BOLT TYPE CONNECTORS SHALL BE USED.
3. GRIND OFF GALVANIZING IN AFFECTED AREA. EXOTHERMICALLY WELD #2 CONDUCTOR AT 6 INCHES ABOVE GRADE R FOUNDATION, WHICHEVER IS HIGHER. COLD-GALV AFTER. EXOTHERMICALLY WELD OTHER END TO THE GROUND.
4. GROUND CONDUCTORS ON EXTERIOR WALL OF SHELTER SHALL BE ENCASED IN PVC CONDUIT TO GRADE. MOUNT PVC WITH GALVANIZED "C" CLAMPS. SEAL TOP ENDS.
5. FOLLOWING COMPLETION OF WORK, CONDUCT GROUND TEST. SUBMIT WRITTEN TEST TO CONSTRUCTION MANAGER AND PROJECT MANAGER.
6. ALL GROUNDING WORK SHALL COMPLY WITH CARRIER(S) STANDARDS.
7. GROUNDING REQUIREMENTS SHOWN ON THIS PLAN ARE FOR ITEMS THAT ARE LOCATED NEAR GRADE LEVEL AND THAT MAY NEED TO BE TIED TO THE BELOW GRADE GROUND RING.
8. UNLESS NOTED OTHERWISE, ALL GROUNDING SHALL BE IN ACCORDANCE WITH SPRINT'S SSEQ DOCUMENTS 3.018.02.004 "BONDING, GROUNDING AND TRANSIENT PROTECTION FOR CELL SITES", AND 3.018.10.002 "SITE RESISTANCE TO EARTH TESTING". ALL GROUNDING SHALL ALSO COMPLY WITH ALL STATE AND LOCAL CODES, AND THE NATIONAL ELECTRICAL CODE (NEC).
9. UNLESS NOTED OTHERWISE, ALL GROUNDING CONNECTIONS SHALL BE MADE BY AN EXOTHERMIC WELD.
10. RESISTANCE TO EARTH TESTING IS REQUIRED PER SPRINT STANDARDS ON ALL NEW SITES.
11. REFER TO "ANTI-THEFT UPDATE TO SPRINT GROUNDING 082412.PDF" FOR GUIDELINE TO SUSPECTED OR ACTUAL THEFT OF GROUND RING.

NOTES:
1) DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2) GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3) WEATHERPROOFING SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.



2 CONNECTION OF GROUND KIT TO ANTENNA CABLE
NOT TO SCALE



3 TYPICAL ANTENNA GROUNDING PLAN
NOT TO SCALE

NOTES:
1. CONTRACTOR TO VERIFY EXISTING LUG SPACES ARE AVAILABLE ON GROUND BAR. ADD ADDITIONAL BUS BAR IF NO LUG SPACES ARE AVAILABLE.
2. ANTENNA GROUNDING CONNECTIONS SHOWN ARE NOT EXACT TO THIS SITE. FOR EXACT ANTENNA LAYOUT REFER TO ANTENNA CONFIGURATION SHEET.

INFINIGY
Design. Build. Deliver.
11 Herbert Drive
Latham, NY 12110
Office # (518) 690-0790
Fax # (518) 690-0793

STATE OF CONNECTICUT
JOHN S. STEVENS
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No.	Submittal / Revision	App'd	Date
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Checked: ADF Date: 11/14/12

Project Number 294-038

Project Title

EAST HARTFORD (CROWN) CT03XC251

1455 FORBES STREET EAST HARTFORD, CT 06118

Prepared For

Sprint VISION

Drawing Scale: AS NOTED

Date: 4/15/13

Drawing Title

GROUNDING PLAN AND DETAILS

Drawing Number

E3

Exhibit – 2

General Power Density Table – (RF Emissions Analysis Report)

(Insert MPE Certification – FST Task 37.5)

EBI Consulting
environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

Sprint Existing Facility

Site ID: CT03XC251

East Hartford (Crown)
1455 Forbes Street
East Hartford, CT 06118

December 28, 2012

21 B Street Burlington, MA 01803 Tel: (781) 273.2500 Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

December 28, 2012

Sprint
Attn: RF Engineering Manager
1 International Boulevard, Suite 800
Mahwah, NJ 07495

Re: Emissions Values for Site: **CT03XC251 – East Hartford (Crown)**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 1455 Forbes Street, East Hartford, CT, for the purpose of determining whether the emissions from the proposed Sprint equipment upgrades on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of μW/cm2 calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the cellular band is approximately 567 $\mu W/cm^2$, and the general population exposure limit for the PCS band is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed upgrades to the existing Sprint Wireless antenna facility located at 1455 Forbes Street, East Hartford, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario. Actual values seen from this site will be dramatically less than those shown in this report. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all emissions were calculated using the following assumptions:

1) 6 CDMA Carriers (1900 MHz) were considered for each sector of the proposed installation.
2) 1 CDMA Carrier (850 MHz) was considered for each sector of the proposed installation
3) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
4) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.
5) The antenna used in this modeling is the APXVSPP18-C-A20. This is based on feedback from the carrier with regards to anticipated antenna selection. This antenna has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario.

6) The antenna mounting height centerline of the proposed antennas is **97 feet** above ground level (AGL)
7) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculation were done with respect to uncontrolled / general public threshold limits

Site ID	CT03XC251 - East Hartford (Crown)
Site Addresss	1455 Forbes Street, East Hartford, CT, 06118
Site Type	Monopole

Sector 1

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	6	120	15.9	97	91	1/2 "	0.5	0	4160.8422	180.6361	18.06361%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	97	91	1/2 "	0.5	0	389.96892	16.92985	2.98586%
														Sector total Power Density Value:		21.049%	

Sector 2

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
2a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	6	120	15.9	97	91	1/2 "	0.5	0	4160.8422	180.6361	18.06361%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	97	91	1/2 "	0.5	0	389.96892	16.92985	2.98586%
														Sector total Power Density Value:		21.049%	

Sector 3

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
3a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	6	120	15.9	97	91	1/2 "	0.5	0	4160.8422	180.6361	18.06361%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	97	91	1/2 "	0.5	0	389.96892	16.92985	2.98586%
														Sector total Power Density Value:		21.049%	

Site Composite MPE %	
Carrier	MPE %
Sprint	63.148%
Clearwire	1.910%
MetroPCS	4.150%
AT&T	24.540%
Verizon Wireless	35.400%
T-Mobile	13.250%
Total Site MPE %	**142.398%**

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Summary

All calculations performed for this analysis yielded results that were above the allowable limits for general public exposure to RF Emissions. However, the area surrounding the tower is a controlled fenced compound, occupational threshold limits would apply to this area.

The anticipated Maximum Composite contributions from the Sprint facility are **63.148% (21.049% from each sector)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level. This is equal to **12.630% (4.210% from each sector)** of the allowable FCC established occupational limit considering all three sectors simultaneously sampled at the ground level

The anticipated composite MPE value for this site assuming all carriers present is **142.398%** of the allowable FCC established general public limit sampled at the ground level. This is equal to **28.480%** of the allowable FCC established occupational limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. Although values could potentially exceed the FCC established general public limit at the base of the tower, this area is well within the FCC established occupational limit for this same area and should be considered in compliance since it is a controlled area.

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803

Exhibit – 3

Structural Modification Report

(Insert SA– FST Task 9.8)

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708

Date: **February 26, 2013**

Andrew Bazinet
Crown Castle USA Inc.
46 Broadway
Albany, NY 12204
585.899.3442

Paul J Ford and Company
250 E. Broad Street, Suite 1500
Columbus, OH 43215
614.221.6679
rkoors@pjfweb.com

Subject: **Structural Modification Report**

Carrier Designation:	***Sprint PCS* Co-Locate**	
	Carrier Site Number:	CT03XC251
	Carrier Site Name:	CT03XC251
Crown Castle Designation:	**Crown Castle BU Number:**	806376
	Crown Castle Site Name:	HRT 100 943239
	Crown Castle JDE Job Number:	190488
	Crown Castle Work Order Number:	581319
	Crown Castle Application Number:	165584 Rev. 7
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37513-0342 BP R1
Site Data:	**1455 FORBES STREET, EAST HARTFORD, Hartford County, CT** **Latitude *41° 43' 53.3"*, Longitude *-72° 36' 28"*** **131 Foot - Monopole Tower**	

Dear Andrew Bazinet,

Paul J Ford and Company is pleased to submit this **"Structural Modification Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 525183, in accordance with application 165584, revision 7.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC4.7: Modified Structure w/ Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at *Paul J Ford and Company* appreciate the opportunity of providing our continuing professional services to you and Crown Castle USA Inc. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Bob Koors, E.I.
Structural Engineer

tnxTower Report - version 6.0.3.0

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708

Date: **February 26, 2013**

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Albany, NY 12204
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250 E. Broad Street, Suite 1500
Columbus, OH 43215
614.221.6679
rkoors@pjfweb.com

Subject: **Structural Modification Report**

Carrier Designation:	***Sprint PCS* Co-Locate**	
	Carrier Site Number:	CT03XC251
	Carrier Site Name:	CT03XC251
Crown Castle Designation:	**Crown Castle BU Number:**	806376
	Crown Castle Site Name:	HRT 100 943239
	Crown Castle JDE Job Number:	190488
	Crown Castle Work Order Number:	581319
	Crown Castle Application Number:	165584 Rev. 7
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37513-0342 BP R1
Site Data:	**1455 FORBES STREET, EAST HARTFORD, Hartford County, CT** **Latitude *41° 43' 53.3"*, Longitude *-72° 36' 28"*** **131 Foot - Monopole Tower**	

Dear Andrew Bazinet,

Paul J Ford and Company is pleased to submit this **"Structural Modification Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 525183, in accordance with application 165584, revision 7.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC4.7: Modified Structure w/ Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at *Paul J Ford and Company* appreciate the opportunity of providing our continuing professional services to you and Crown Castle USA Inc. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Bob Koors, E.I.
Structural Engineer

tnxTower Report - version 6.0.3.0

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1) INTRODUCTION

This tower is a 131 ft Monopole tower designed by VALMONT in January of 1999.
The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Notes
97.0	97.0	3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe	3	1-1/4	-
		3	rfs celwave	IBC1900BB-1			
		3	rfs celwave	IBC1900HG-2A			
95.0	95.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	-	-	-
		6	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
		1	tower mounts	Side Arm Mount [SO 101-3]			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Notes
128.0	128.0	3	rfs	APX18-206517S-C w/ Mount Pipe	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			
121.0	121.0	1	tower mounts	T-Arm Mount [TA 601-3]	1 2	3/8 ¾	2
	120.0	3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
		3	kathrein	800 10121 w/ Mount Pipe	6	1-1/4	1
		6	powerwave technologies	LGP21401			
119.0	119.0	6	ericsson	RRUS-11	-	-	2
		1	tower mounts	Side Arm Mount [SO 102-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Notes
107.0	109.0	3	alcatel lucent	RRH2x40-AWS	1	1-5/8	2
		3	antel	BXA-171085-8CF-EDIN-2 w/ Mount Pipe			
		3	antel	BXA-80063/4CF w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		2	adc	DUAL BAND 800/1900 FULL BAND MASTHEAD	12	1-5/8	1
		1	antel	BXA-185060/8CFx2 w/ Mount Pipe			
		2	antel	BXA-185090/8CF w/ Mount Pipe			
		3	antel	BXA-70063/6CFx4 w/ Mount Pipe			
		6	rfs celwave	FD9R6004/1C-3L			
	107.0	1	tower mounts	Platform Mount (LP 101-1)			
97.0	101.0	2	andrew	VHLP2.5-11	3 3	5/16 1/2	1
		2	dragonwave	HORIZON COMPACT			
	97.0	3	kathrein	840 10054 w/ Mount Pipe			
		1	motorola	TIMING 2000			
		3	samsung telecommunications	WIMAX DAP HEAD			
		1	tower mounts	Platform Mount [LP 602-1]			
		6	decibel	DB980H90E-M w/ Mount Pipe	6 6	1-1/4 1-5/8	3
87.0	87.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	1	1-5/8	2
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
		1	tower mounts	Side Arm Mount [SO 702-3]	12	1-1/4	1

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Welti	262381	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Valmont	262389	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Valmont	262386	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF	3249954	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	Valmont	645113	CCISITES

3.1) Analysis Method

tnxTower (version 6.0.3.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Monopole was fabricated and installed in accordance with the manufacturer's specifications.
2) Monopole has been properly maintained in accordance with manufacturer's specifications.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) Monopole will be reinforced in conformance with the referenced proposed modification drawings.
5) Monopole was reinforced in conformance with the attached modification drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	131 - 110	Pole	TP15.525x10.525x0.188	1	-2	483	38.7	Pass
L2	110 - 84.5833	Pole	TP21.883x15.525x0.25	2	-9	905	96.8	Pass
L3	84.5833 - 70	Pole	TP25.531x21.883x0.378	3	-10	1471	81.1	Pass
L4	70 - 67.0833	Pole	TP25.76x23.775x0.436	4	-12	1781	78.9	Pass
L5	67.0833 - 44.5833	Pole	TP31.388x25.76x0.411	5	-16	2066	92.3	Pass
L6	44.5833 - 34.08	Pole	TP34.015x31.388x0.406	6	-18	2135	94.5	Pass
L7	34.08 - 18.75	Pole	TP37.216x31.972x0.425	7	-21	2438	95.4	Pass
L8	18.75 - 0	Pole	TP41.9x37.216x0.408	8	-25	2567	99.4	Pass
							Summary	
						Pole (L8)	99.4	Pass
						Rating =	99.4	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC4.7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	92.7	Pass
1	Base Plate	0	66.5	Pass
1	Base Foundation Steel	0	56.0	Pass
1	Base Foundation Soil Interaction	0	65.0	Pass
1	Flange Connection	110	30.1	Pass
	Structure Rating (max from all components) =			99.4%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

Reinforce monopole in conformance with the attached proposed modification drawings.

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

4) Tower is located in Hartford County, Connecticut.
5) Basic wind speed of 80 mph.
6) Nominal ice thickness of 1.250 in.
7) Ice thickness is considered to increase with height.
8) Ice density of 56 pcf.
9) A wind speed of 38 mph is used in combination with ice.
10) Temperature drop of 50 °F.
11) Deflections calculated using a wind speed of 50 mph.
12) A non-linear (P-delta) analysis was used.
13) Pressures are calculated at each section.
14) Stress ratio used in pole design is 1.333.
15) Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	SR Leg Bolts Resist Compression
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	All Leg Panels Have Same Allowable
√ Escalate Ice	√ Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	Include Angle Block Shear Check
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Poles
Leg Bolts Are At Top Of Section	SR Members Have Cut Ends	√ Include Shear-Torsion Interaction
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination		

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	131.00-110.00	21.00	0.00	12	10.525	15.525	0.188	0.752	A572-65 (65 ksi)
L2	110.00-84.58	25.42	0.00	12	15.525	21.883	0.250	1.000	A572-65 (65 ksi)
L3	84.58-70.00	14.58	4.00	12	21.883	25.531	0.378	1.512	Reinf 62.57 ksi (63 ksi)
L4	70.00-67.08	6.92	0.00	12	23.775	25.760	0.436	1.743	Reinf 62.66 ksi (63 ksi)
L5	67.08-44.58	22.50	0.00	12	25.760	31.388	0.411	1.644	Reinf 63.01 ksi (63 ksi)
L6	44.58-34.08	10.50	4.92	12	31.388	34.015	0.406	1.625	Reinf 63.04 ksi (63 ksi)
L7	34.08-18.75	20.25	0.00	12	31.972	37.216	0.425	1.702	Reinf 63.22 ksi (63 ksi)
L8	18.75-0.00	18.75		12	37.216	41.900	0.408	1.630	Reinf 63.30 ksi (63 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	10.896	6.258	85.346	3.701	5.452	15.654	172.934	3.080	2.317	12.324
	16.073	9.284	278.754	5.491	8.042	34.662	564.831	4.570	3.657	19.451
L2	16.073	12.296	366.206	5.468	8.042	45.537	742.033	6.052	3.491	13.963
	22.655	17.415	1040.235	7.745	11.335	91.769	2107.798	8.571	5.195	20.779
L3	22.655	26.170	1544.810	7.699	11.335	136.282	3130.205	12.880	4.852	12.838
	26.432	30.610	2471.873	9.005	13.225	186.908	5008.685	15.065	5.829	15.425
L4	25.802	32.749	2276.892	8.355	12.315	184.885	4613.601	16.118	5.204	11.941
	26.669	35.535	2908.837	9.066	13.344	217.993	5894.093	17.489	5.736	13.162
L5	26.669	33.541	2750.982	9.075	13.344	206.163	5574.236	16.508	5.802	14.121
	32.495	40.988	5020.126	11.090	16.259	308.762	10172.137	20.173	7.311	17.791
L6	32.495	40.527	4965.201	11.091	16.259	305.383	10060.844	19.946	7.323	18.027
	35.215	43.963	6338.434	12.032	17.620	359.734	12843.386	21.637	8.027	19.76
L7	34.419	43.210	5488.748	11.294	16.561	331.417	11121.691	21.267	7.428	17.463
	38.529	50.393	8706.480	13.171	19.278	451.626	17641.689	24.802	8.834	20.767
L8	38.529	48.309	8354.470	13.178	19.278	433.367	16928.421	23.776	8.882	21.791
	43.378	54.456	11966.615	14.854	21.704	551.350	24247.607	26.802	10.137	24.87

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 131.00-110.00				1	1	1		
L2 110.00-84.58				1	1	1		
L3 84.58-70.00				1	1	1		
L4 70.00-67.08				1	1	1		
L5 67.08-44.58				1	1	1		
L6 44.58-34.08				1	1	1		
L7 34.08-18.75				1	1	1		
L8 18.75-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
**										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
CR 50 1873(1-5/8")	C	No	CaAa (Out Of Face)	128.00 - 0.00	4	No Ice	0.00	0.83
						1/2" Ice	0.00	2.34
						1" Ice	0.00	4.47
						2" Ice	0.00	10.55
						4" Ice	0.00	30.05
CR 50 1873(1-5/8")	C	No	CaAa (Out Of Face)	128.00 - 0.00	2	No Ice	0.20	0.83
						1/2" Ice	0.30	2.34

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1" Ice	0.40	4.47
						2" Ice	0.60	10.55
						4" Ice	1.00	30.05
**								
LDF6-50A(1-1/4")	C	No	CaAa (Out Of Face)	87.00 - 0.00	6	No Ice	0.00	0.66
						1/2" Ice	0.00	1.91
						1" Ice	0.00	3.78
						2" Ice	0.00	9.33
						4" Ice	0.00	27.78
LDF6-50A(1-1/4")	C	No	CaAa (Out Of Face)	121.00 - 87.00	5	No Ice	0.00	0.66
						1/2" Ice	0.00	1.91
						1" Ice	0.00	3.78
						2" Ice	0.00	9.33
						4" Ice	0.00	27.78
LDF6-50A(1-1/4")	C	No	CaAa (Out Of Face)	121.00 - 87.00	1	No Ice	0.16	0.66
						1/2" Ice	0.25	1.91
						1" Ice	0.35	3.78
						2" Ice	0.55	9.33
						4" Ice	0.95	27.78
FB-L98B-002-75000(3/8")	C	No	CaAa (Out Of Face)	121.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.60
						1" Ice	0.00	1.76
						2" Ice	0.00	5.91
						4" Ice	0.00	21.53
WR-VG86ST-BRD(3/4)	C	No	CaAa (Out Of Face)	121.00 - 0.00	2	No Ice	0.00	0.59
						1/2" Ice	0.00	1.37
						1" Ice	0.00	2.76
						2" Ice	0.00	7.37
						4" Ice	0.00	23.92
**								
HJ7-50A(1-5/8")	C	No	Inside Pole	107.00 - 0.00	12	No Ice	0.00	1.04
						1/2" Ice	0.00	1.04
						1" Ice	0.00	1.04
						2" Ice	0.00	1.04
						4" Ice	0.00	1.04
HB158-1-08U8-S8J18(1-5/8)	C	No	CaAa (Out Of Face)	107.00 - 0.00	1	No Ice	0.00	1.30
						1/2" Ice	0.00	2.81
						1" Ice	0.00	4.94
						2" Ice	0.00	11.02
						4" Ice	0.00	30.52
**								
ATCB-B01-005(5/16)	C	No	Inside Pole	97.00 - 0.00	3	No Ice	0.00	0.07
						1/2" Ice	0.00	0.07
						1" Ice	0.00	0.07
						2" Ice	0.00	0.07
						4" Ice	0.00	0.07
FSJ4-50B(1/2")	C	No	Inside Pole	97.00 - 0.00	2	No Ice	0.00	0.14
						1/2" Ice	0.00	0.14
						1" Ice	0.00	0.14
						2" Ice	0.00	0.14
						4" Ice	0.00	0.14
HB114-1-08U4-M5J(1 1/4")	C	No	CaAa (Out Of Face)	97.00 - 0.00	3	No Ice	0.00	1.08
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.18
						2" Ice	0.00	9.73
						4" Ice	0.00	28.15
FSJ4-50B(1/2")	C	No	CaAa (Out Of Face)	97.00 - 0.00	1	No Ice	0.00	0.14
						1/2" Ice	0.00	0.76
						1" Ice	0.00	2.00
						2" Ice	0.00	6.30
						4" Ice	0.00	22.23
2" Rigid Conduit	C	No	CaAa (Out Of Face)	97.00 - 0.00	2	No Ice	0.00	0.95
						1/2" Ice	0.00	2.48
						1" Ice	0.00	4.62
						2" Ice	0.00	10.72
						4" Ice	0.00	30.27
**								
LCF114-50J(1-1/4")	C	No	CaAa (Out Of Face)	87.00 - 0.00	10	No Ice	0.00	0.70
						1/2" Ice	0.00	1.97

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1" Ice	0.00	3.85
						2" Ice	0.00	9.45
						4" Ice	0.00	27.97
LCF114-50J(1-1/4")	C	No	CaAa (Out Of Face)	87.00 - 0.00	2	No Ice	0.16	0.70
						1/2" Ice	0.26	1.97
						1" Ice	0.36	3.85
						2" Ice	0.56	9.45
						4" Ice	0.96	27.97
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	C	No	CaAa (Out Of Face)	87.00 - 0.00	1	No Ice	0.16	1.07
						1/2" Ice	0.26	2.37
						1" Ice	0.36	4.28
						2" Ice	0.56	9.93
						4" Ice	0.96	28.56
**								
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	20.50 - 0.00	1	No Ice	0.17	0.11
						1/2" Ice	0.28	11.08
						1" Ice	0.39	12.51
						2" Ice	0.61	16.40
						4" Ice	1.06	28.32
3/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	85.83 - 20.50	1	No Ice	0.13	6.00
						1/2" Ice	0.24	6.56
						1" Ice	0.35	7.47
						2" Ice	0.57	10.32
						4" Ice	1.01	20.17
3/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	60.50 - 0.00	1	No Ice	0.13	6.00
						1/2" Ice	0.24	6.56
						1" Ice	0.35	7.47
						2" Ice	0.57	10.32
						4" Ice	1.01	20.17
**								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	131.00-110.00	A	0.000	0.000	0.000	0.000	0
		B	0.000	0.000	0.000	0.000	0
		C	0.000	0.000	0.000	8.833	0
L2	110.00-84.58	A	0.000	0.000	0.000	0.000	0
		B	0.000	0.000	0.000	0.000	0
		C	0.000	0.000	0.000	14.943	1
L3	84.58-70.00	A	0.000	0.000	0.000	0.000	0
		B	0.000	0.000	0.000	0.000	0
		C	0.000	0.000	0.000	14.576	1
L4	70.00-67.08	A	0.000	0.000	0.000	0.000	0
		B	0.000	0.000	0.000	0.000	0
		C	0.000	0.000	0.000	2.915	0
L5	67.08-44.58	A	0.000	0.000	0.000	0.000	0
		B	0.000	0.000	0.000	0.000	0
		C	0.000	0.000	0.000	24.479	1
L6	44.58-34.08	A	0.000	0.000	0.000	0.000	0
		B	0.000	0.000	0.000	0.000	0
		C	0.000	0.000	0.000	11.811	1
L7	34.08-18.75	A	0.000	0.000	0.000	0.000	0
		B	0.000	0.000	0.000	0.000	0
		C	0.000	0.000	0.000	17.312	1
L8	18.75-0.00	A	0.000	0.000	0.000	0.000	0
		B	0.000	0.000	0.000	0.000	0
		C	0.000	0.000	0.000	21.866	1

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	131.00-110.00	A	1.459	0.000	0.000	0.000	0.000	0
		B		0.000	0.000	0.000	0.000	0
		C		0.000	0.000	0.000	22.549	1
L2	110.00-84.58	A	1.422	0.000	0.000	0.000	0.000	0
		B		0.000	0.000	0.000	0.000	0
		C		0.000	0.000	0.000	38.396	3
L3	84.58-70.00	A	1.384	0.000	0.000	0.000	0.000	0
		B		0.000	0.000	0.000	0.000	0
		C		0.000	0.000	0.000	39.244	3
L4	70.00-67.08	A	1.365	0.000	0.000	0.000	0.000	0
		B		0.000	0.000	0.000	0.000	0
		C		0.000	0.000	0.000	7.849	1
L5	67.08-44.58	A	1.330	0.000	0.000	0.000	0.000	0
		B		0.000	0.000	0.000	0.000	0
		C		0.000	0.000	0.000	65.769	5
L6	44.58-34.08	A	1.276	0.000	0.000	0.000	0.000	0
		B		0.000	0.000	0.000	0.000	0
		C		0.000	0.000	0.000	31.175	2
L7	34.08-18.75	A	1.250	0.000	0.000	0.000	0.000	0
		B		0.000	0.000	0.000	0.000	0
		C		0.000	0.000	0.000	45.574	3
L8	18.75-0.00	A	1.250	0.000	0.000	0.000	0.000	0
		B		0.000	0.000	0.000	0.000	0
		C		0.000	0.000	0.000	55.720	4

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	131.00-110.00	-0.409	0.236	-0.656	0.379
L2	110.00-84.58	-0.560	0.323	-0.935	0.540
L3	84.58-70.00	-0.862	0.498	-1.410	0.814
L4	70.00-67.08	-0.881	0.509	-1.467	0.847
L5	67.08-44.58	-0.972	0.561	-1.641	0.947
L6	44.58-34.08	-1.034	0.597	-1.779	1.027
L7	34.08-18.75	-1.060	0.612	-1.852	1.069
L8	18.75-0.00	-1.119	0.646	-1.965	1.134

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APX18-206517S-C w/ Mount Pipe	A	From Face	1.00 0 0	0.000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.17 5.62 6.08 7.02 9.12	3.17 3.66 4.18 5.27 7.67	0 0 0 0 0
APX18-206517S-C w/ Mount Pipe	B	From Face	1.00 0 0	0.000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.17 5.62 6.08 7.02 9.12	3.17 3.66 4.18 5.27 7.67	0 0 0 0 0
APX18-206517S-C w/	C	From Face	1.00	0.000	128.00	No Ice	5.17	3.17	0

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Mount Pipe			0 0			1/2" Ice	5.62 6.08	3.66 4.18	0 0
						1" Ice	7.02	5.27	0
						2" Ice	9.12	7.67	0
						4" Ice			
Pipe Mount [PM 601-3]	C	None		0.000	128.00	No Ice	4.39	4.39	0
						1/2" Ice	5.48	5.48	0
						1" Ice	6.57	6.57	0
						2" Ice	8.75	8.75	0
						4" Ice	13.11	13.11	1
**									
800 10121 w/ Mount Pipe	A	From Face	4.00 0 -1	0.000	121.00	No Ice 1/2" Ice	6.03 6.71	4.95 6.02	0 0
						1" Ice	7.30	6.81	0
						2" Ice	8.50	8.46	0
						4" Ice	11.04	12.10	1
800 10121 w/ Mount Pipe	B	From Face	4.00 0 -1	0.000	121.00	No Ice 1/2" Ice	6.03 6.71	4.95 6.02	0 0
						1" Ice	7.30	6.81	0
						2" Ice	8.50	8.46	0
						4" Ice	11.04	12.10	1
800 10121 w/ Mount Pipe	C	From Face	4.00 0 -1	0.000	121.00	No Ice 1/2" Ice	6.03 6.71	4.95 6.02	0 0
						1" Ice	7.30	6.81	0
						2" Ice	8.50	8.46	0
						4" Ice	11.04	12.10	1
(2) LGP21401	A	From Face	4.00 0 -1	0.000	121.00	No Ice 1/2" Ice	1.29 1.45	0.23 0.31	0 0
						1" Ice	1.61	0.40	0
						2" Ice	1.97	0.61	0
						4" Ice	2.79	1.12	0
(2) LGP21401	B	From Face	4.00 0 -1	0.000	121.00	No Ice 1/2" Ice	1.29 1.45	0.23 0.31	0 0
						1" Ice	1.61	0.40	0
						2" Ice	1.97	0.61	0
						4" Ice	2.79	1.12	0
(2) LGP21401	C	From Face	4.00 0 -1	0.000	121.00	No Ice 1/2" Ice	1.29 1.45	0.23 0.31	0 0
						1" Ice	1.61	0.40	0
						2" Ice	1.97	0.61	0
						4" Ice	2.79	1.12	0
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Face	4.00 0 -1	0.000	121.00	No Ice 1/2" Ice	8.50 9.15	6.30 7.48	0 0
						1" Ice	9.77	8.37	0
						2" Ice	11.03	10.18	0
						4" Ice	13.68	14.02	1
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Face	4.00 0 -1	0.000	121.00	No Ice 1/2" Ice	8.50 9.15	6.30 7.48	0 0
						1" Ice	9.77	8.37	0
						2" Ice	11.03	10.18	0
						4" Ice	13.68	14.02	1
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Face	4.00 0 -1	0.000	121.00	No Ice 1/2" Ice	8.50 9.15	6.30 7.48	0 0
						1" Ice	9.77	8.37	0
						2" Ice	11.03	10.18	0
							13.68	14.02	1

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice			
DC6-48-60-18-8F	A	From Face	4.00 0 -1	0.000	121.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.47 1.67 1.88 2.33 3.38	1.47 1.67 1.88 2.33 3.38	0 0 0 0 0
T-Arm Mount [TA 601-3]	C	None		0.000	121.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.90 14.65 18.40 25.90 40.90	10.90 14.65 18.40 25.90 40.90	1 1 1 2 2
**									
(2) RRUS-11	A	From Face	4.00 0 0	0.000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0 0 0 0 0
(2) RRUS-11	B	From Face	4.00 0 0	0.000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0 0 0 0 0
(2) RRUS-11	C	From Face	4.00 0 0	0.000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0 0 0 0 0
Side Arm Mount [SO 102-3]	C	From Face	0.00 0 0	0.000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.48 3.96 4.92 6.84	3.00 3.48 3.96 4.92 6.84	0 0 0 0 0
**									
BXA-70063/6CFx4 w/ Mount Pipe	A	From Face	4.00 0 2	0.000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.97 8.61 9.22 10.46 13.07	5.40 6.55 7.41 9.18 12.93	0 0 0 0 1
BXA-70063/6CFx4 w/ Mount Pipe	B	From Face	4.00 0 2	0.000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.97 8.61 9.22 10.46 13.07	5.40 6.55 7.41 9.18 12.93	0 0 0 0 1
BXA-70063/6CFx4 w/ Mount Pipe	C	From Face	4.00 0 2	0.000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.97 8.61 9.22 10.46 13.07	5.40 6.55 7.41 9.18 12.93	0 0 0 0 1
BXA-185090/8CF w/ Mount Pipe	A	From Face	4.00 0 2	0.000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.16 3.53 3.94 4.83 6.73	3.33 3.94 4.56 5.86 8.84	0 0 0 0 0
BXA-185090/8CF w/ Mount Pipe	B	From Face	4.00 0	0.000	107.00	No Ice 1/2"	3.16 3.53	3.33 3.94	0 0

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			2			Ice	3.94	4.56	0
						1" Ice	4.83	5.86	0
						2" Ice	6.73	8.84	0
						4" Ice			
BXA-185060/8CFx2 w/ Mount Pipe	C	From Face	4.00 0 2	0.000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.29 3.68 4.08 4.99 6.95	3.10 3.75 4.39 5.72 8.64	0 0 0 0 0
(2) FD9R6004/1C-3L	A	From Face	4.00 0 2	0.000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0 0 0 0 0
(2) FD9R6004/1C-3L	B	From Face	4.00 0 2	0.000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0 0 0 0 0
(2) FD9R6004/1C-3L	C	From Face	4.00 0 2	0.000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0 0 0 0 0
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	A	From Face	4.00 0 2	0.000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.55 1.72 1.90 2.28 3.14	0.81 0.94 1.09 1.40 2.12	0 0 0 0 0
BXA-80063/4CF w/ Mount Pipe	A	From Face	4.00 0 2	0.000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.84 6.30 7.24 9.26	3.42 4.02 4.64 5.92 8.93	0 0 0 0 1
BXA-80063/4CF w/ Mount Pipe	B	From Face	4.00 0 2	0.000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.84 6.30 7.24 9.26	3.42 4.02 4.64 5.92 8.93	0 0 0 0 1
BXA-80063/4CF w/ Mount Pipe	C	From Face	4.00 0 2	0.000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.84 6.30 7.24 9.26	3.42 4.02 4.64 5.92 8.93	0 0 0 0 1
BXA-171085-8CF-EDIN-2 w/ Mount Pipe	A	From Face	4.00 0 2	0.000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.18 3.56 3.96 4.85 6.77	3.35 3.97 4.60 5.89 8.89	0 0 0 0 0
BXA-171085-8CF-EDIN-2 w/ Mount Pipe	B	From Face	4.00 0 2	0.000	107.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.18 3.56 3.96 4.85 6.77	3.35 3.97 4.60 5.89 8.89	0 0 0 0 0
BXA-171085-8CF-EDIN-2	C	From Face	4.00	0.000	107.00	No Ice	3.18	3.35	0

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
w/ Mount Pipe			0 2			1/2" Ice	3.56 3.96	3.97 4.60	0 0
						1" Ice	4.85	5.89	0
						2" Ice	6.77	8.89	0
						4" Ice			
RRH2x40-AWS	A	From Face	4.00 0 2	0.000	107.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0 0 0 0 0
RRH2x40-AWS	B	From Face	4.00 0 2	0.000	107.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0 0 0 0 0
RRH2x40-AWS	C	From Face	4.00 0 2	0.000	107.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0 0 0 0 0
DB-T1-6Z-8AB-0Z	C	From Face	4.00 0 2	0.000	107.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	5.60 5.92 6.24 6.91 8.37	2.33 2.56 2.79 3.28 4.37	0 0 0 0 0
Platform Mount (LP 101-1)	C	None		0.000	107.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	36.21 42.82 49.43 62.65 89.09	36.21 42.82 49.43 62.65 89.09	2 2 3 5 8
Clearwire TIMING 2000	A	From Face	4.00 0 0	0.000	97.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	0.13 0.18 0.24 0.38 0.78	0.13 0.18 0.24 0.38 0.78	0 0 0 0 0
840 10054 w/ Mount Pipe	A	From Face	4.00 0 0	0.000	97.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	5.41 5.83 6.26 7.16 9.09	2.39 2.92 3.47 4.61 7.32	0 0 0 0 1
840 10054 w/ Mount Pipe	B	From Face	4.00 0 0	0.000	97.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	5.41 5.83 6.26 7.16 9.09	2.39 2.92 3.47 4.61 7.32	0 0 0 0 1
840 10054 w/ Mount Pipe	C	From Face	4.00 0 0	0.000	97.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	5.41 5.83 6.26 7.16 9.09	2.39 2.92 3.47 4.61 7.32	0 0 0 0 1
WIMAX DAP HEAD	A	From Face	4.00 0 0	0.000	97.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice	1.80 1.99 2.18 2.59 3.51	0.78 0.92 1.07 1.39 2.14	0 0 0 0 0

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice			
WIMAX DAP HEAD	B	From Face	4.00 0 0	0.000	97.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	1.80 1.99 2.18 2.59 3.51	0.78 0.92 1.07 1.39 2.14	0 0 0 0 0
WIMAX DAP HEAD	C	From Face	4.00 0 0	0.000	97.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	1.80 1.99 2.18 2.59 3.51	0.78 0.92 1.07 1.39 2.14	0 0 0 0 0
HORIZON COMPACT	B	From Face	4.00 0 4	0.000	97.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	0.84 0.97 1.10 1.39 2.08	0.43 0.52 0.63 0.86 1.43	0 0 0 0 0
HORIZON COMPACT	C	From Face	4.00 0 4	0.000	97.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	0.84 0.97 1.10 1.39 2.08	0.43 0.52 0.63 0.86 1.43	0 0 0 0 0
Sprint APXVSPP18-C-A20 w/ Mount Pipe	A	From Face	4.00 0 0	0.000	97.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0 0 0 0 1
APXVSPP18-C-A20 w/ Mount Pipe	B	From Face	4.00 0 0	0.000	97.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0 0 0 0 1
APXVSPP18-C-A20 w/ Mount Pipe	C	From Face	4.00 0 0	0.000	97.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0 0 0 0 1
IBC1900HG-2A	A	From Face	4.00 0 0	0.000	97.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	1.13 1.27 1.43 1.76 2.53	0.53 0.65 0.77 1.04 1.69	0 0 0 0 0
IBC1900HG-2A	B	From Face	4.00 0 0	0.000	97.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	1.13 1.27 1.43 1.76 2.53	0.53 0.65 0.77 1.04 1.69	0 0 0 0 0
IBC1900HG-2A	C	From Face	4.00 0 0	0.000	97.00	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	1.13 1.27 1.43 1.76 2.53	0.53 0.65 0.77 1.04 1.69	0 0 0 0 0
IBC1900BB-1	A	From Face	4.00 0 0	0.000	97.00	No Ice 1/2" Ice Ice	1.13 1.27 1.43	0.53 0.65 0.77	0 0 0

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	1.76	1.04	0
						2" Ice	2.53	1.69	0
						4" Ice			
IBC1900BB-1	B	From Face	4.00 0 0	0.000	97.00	No Ice	1.13	0.53	0
						1/2" Ice	1.27	0.65	0
						1" Ice	1.43	0.77	0
						2" Ice	1.76	1.04	0
						4" Ice	2.53	1.69	0
IBC1900BB-1	C	From Face	4.00 0 0	0.000	97.00	No Ice	1.13	0.53	0
						1/2" Ice	1.27	0.65	0
						1" Ice	1.43	0.77	0
						2" Ice	1.76	1.04	0
						4" Ice	2.53	1.69	0
Platform Mount [LP 602-1]	C	None		0.000	97.00	No Ice	32.03	32.03	1
						1/2" Ice	38.71	38.71	2
						1" Ice	45.39	45.39	2
						2" Ice	58.75	58.75	3
						4" Ice	85.47	85.47	5
**									
(2) PCS 1900MHz 4x45W-65MHz	A	From Face	4.00 0 0	0.000	95.00	No Ice	2.71	2.61	0
						1/2" Ice	2.95	2.85	0
						1" Ice	3.20	3.09	0
						2" Ice	3.72	3.61	0
						4" Ice	4.86	4.74	0
(2) PCS 1900MHz 4x45W-65MHz	B	From Face	4.00 0 0	0.000	95.00	No Ice	2.71	2.61	0
						1/2" Ice	2.95	2.85	0
						1" Ice	3.20	3.09	0
						2" Ice	3.72	3.61	0
						4" Ice	4.86	4.74	0
(2) PCS 1900MHz 4x45W-65MHz	B	From Face	4.00 0 0	0.000	95.00	No Ice	2.71	2.61	0
						1/2" Ice	2.95	2.85	0
						1" Ice	3.20	3.09	0
						2" Ice	3.72	3.61	0
						4" Ice	4.86	4.74	0
800MHz 2X50W RRH W/FILTER	A	From Face	4.00 0 0	0.000	95.00	No Ice	2.40	2.25	0
						1/2" Ice	2.61	2.46	0
						1" Ice	2.83	2.68	0
						2" Ice	3.30	3.13	0
						4" Ice	4.34	4.15	0
800MHz 2X50W RRH W/FILTER	B	From Face	4.00 0 0	0.000	95.00	No Ice	2.40	2.25	0
						1/2" Ice	2.61	2.46	0
						1" Ice	2.83	2.68	0
						2" Ice	3.30	3.13	0
						4" Ice	4.34	4.15	0
800MHz 2X50W RRH W/FILTER	C	From Face	4.00 0 0	0.000	95.00	No Ice	2.40	2.25	0
						1/2" Ice	2.61	2.46	0
						1" Ice	2.83	2.68	0
						2" Ice	3.30	3.13	0
						4" Ice	4.34	4.15	0
Side Arm Mount [SO 101-3]	C	None		0.000	95.00	No Ice	7.50	7.50	0
						1/2" Ice	8.90	8.90	0
						1" Ice	10.30	10.30	0
						2" Ice	13.10	13.10	1
						4" Ice	18.70	18.70	1
**									

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Face	4.00 0 0	0.000	87.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0 0 0 0 1
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Face	4.00 0 0	0.000	87.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0 0 0 0 1
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Face	4.00 0 0	0.000	87.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0 0 0 0 1
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Face	4.00 0 0	0.000	87.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0 0 0 0 1
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Face	4.00 0 0	0.000	87.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0 0 0 0 1
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Face	4.00 0 0	0.000	87.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0 0 0 0 1
KRY 112 144/1	A	From Face	4.00 0 0	0.000	87.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.59 0.81 1.36	0.20 0.27 0.35 0.53 1.00	0 0 0 0 0
KRY 112 144/1	B	From Face	4.00 0 0	0.000	87.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.59 0.81 1.36	0.20 0.27 0.35 0.53 1.00	0 0 0 0 0
KRY 112 144/1	C	From Face	4.00 0 0	0.000	87.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.59 0.81 1.36	0.20 0.27 0.35 0.53 1.00	0 0 0 0 0
Side Arm Mount [SO 702-3] **	C	None		0.000	87.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.22 4.15 5.08 6.94 10.66	3.22 4.15 5.08 6.94 10.66	0 0 0 0 0

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter		Aperture Area	Weight
				ft	°	°	ft	ft		ft^2	K
VHLP2.5-11	A	Paraboloid w/Shroud (HP)	From Leg	1.00 0 4	0.000		97.00	2.92	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.68 7.07 7.46 8.23 9.78	0 0 0 0 0
VHLP2.5-11	B	Paraboloid w/Shroud (HP)	From Leg	1.00 0 4	0.000		97.00	2.92	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.68 7.07 7.46 8.23 9.78	0 0 0 0 0
**											

Tower Pressures - No Ice

G_H = 1.690

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
L1 131.00-110.00	119.83	1.445	23.68	22.794	A	0.000	22.794	22.794	100.00	0.000	0.000
					B	0.000	22.794		100.00	0.000	0.000
					C	0.000	22.794		100.00	0.000	8.833
L2 110.00-84.58	96.57	1.359	22.27	39.616	A	0.000	39.616	39.616	100.00	0.000	0.000
					B	0.000	39.616		100.00	0.000	0.000
					C	0.000	39.616		100.00	0.000	14.943
L3 84.58-70.00	77.10	1.274	20.88	28.811	A	0.000	28.811	28.811	100.00	0.000	0.000
					B	0.000	28.811		100.00	0.000	0.000
					C	0.000	28.811		100.00	0.000	14.576
L4 70.00-67.08	68.53	1.232	20.19	6.159	A	0.000	6.159	6.159	100.00	0.000	0.000
					B	0.000	6.159		100.00	0.000	0.000
					C	0.000	6.159		100.00	0.000	2.915
L5 67.08-44.58	55.46	1.16	19.00	53.576	A	0.000	53.576	53.576	100.00	0.000	0.000
					B	0.000	53.576		100.00	0.000	0.000
					C	0.000	53.576		100.00	0.000	24.479
L6 44.58-34.08	39.26	1.051	17.22	28.623	A	0.000	28.623	28.623	100.00	0.000	0.000
					B	0.000	28.623		100.00	0.000	0.000
					C	0.000	28.623		100.00	0.000	11.811
L7 34.08-18.75	26.27	1	16.38	45.008	A	0.000	45.008	45.008	100.00	0.000	0.000
					B	0.000	45.008		100.00	0.000	0.000
					C	0.000	45.008		100.00	0.000	17.312
L8 18.75-0.00	9.19	1	16.38	61.810	A	0.000	61.810	61.810	100.00	0.000	0.000
					B	0.000	61.810		100.00	0.000	0.000
					C	0.000	61.810		100.00	0.000	21.866

Tower Pressure - With Ice

G_H = 1.690

Section Elevation	z	K_Z	q_z	t_Z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	in	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
L1 131.00-110.00	119.83	1.445	5.23	1.459	27.901	A	0.000	27.901	27.901	100.00	0.000	0.000
						B	0.000	27.901		100.00	0.000	0.000
						C	0.000	27.901		100.00	0.000	22.549

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L2 110.00-84.58	96.57	1.359	4.92	1.422	45.640	A	0.000	45.640	45.640	100.00	0.000	0.000
						B	0.000	45.640		100.00	0.000	0.000
						C	0.000	45.640		100.00	0.000	38.396
L3 84.58-70.00	77.10	1.274	4.61	1.384	32.174	A	0.000	32.174	32.174	100.00	0.000	0.000
						B	0.000	32.174		100.00	0.000	0.000
						C	0.000	32.174		100.00	0.000	39.244
L4 70.00-67.08	68.53	1.232	4.46	1.365	6.832	A	0.000	6.832	6.832	100.00	0.000	0.000
						B	0.000	6.832		100.00	0.000	0.000
						C	0.000	6.832		100.00	0.000	7.849
L5 67.08-44.58	55.46	1.16	4.20	1.330	58.565	A	0.000	58.565	58.565	100.00	0.000	0.000
						B	0.000	58.565		100.00	0.000	0.000
						C	0.000	58.565		100.00	0.000	65.769
L6 44.58-34.08	39.26	1.051	3.80	1.276	30.857	A	0.000	30.857	30.857	100.00	0.000	0.000
						B	0.000	30.857		100.00	0.000	0.000
						C	0.000	30.857		100.00	0.000	31.175
L7 34.08-18.75	26.27	1	3.62	1.250	48.269	A	0.000	48.269	48.269	100.00	0.000	0.000
						B	0.000	48.269		100.00	0.000	0.000
						C	0.000	48.269		100.00	0.000	45.574
L8 18.75-0.00	9.19	1	3.62	1.250	65.716	A	0.000	65.716	65.716	100.00	0.000	0.000
						B	0.000	65.716		100.00	0.000	0.000
						C	0.000	65.716		100.00	0.000	55.720

Tower Pressure - Service

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 131.00-110.00	119.83	1.445	9.25	22.794	A	0.000	22.794	22.794	100.00	0.000	0.000
					B	0.000	22.794		100.00	0.000	0.000
					C	0.000	22.794		100.00	0.000	8.833
L2 110.00-84.58	96.57	1.359	8.70	39.616	A	0.000	39.616	39.616	100.00	0.000	0.000
					B	0.000	39.616		100.00	0.000	0.000
					C	0.000	39.616		100.00	0.000	14.943
L3 84.58-70.00	77.10	1.274	8.16	28.811	A	0.000	28.811	28.811	100.00	0.000	0.000
					B	0.000	28.811		100.00	0.000	0.000
					C	0.000	28.811		100.00	0.000	14.576
L4 70.00-67.08	68.53	1.232	7.89	6.159	A	0.000	6.159	6.159	100.00	0.000	0.000
					B	0.000	6.159		100.00	0.000	0.000
					C	0.000	6.159		100.00	0.000	2.915
L5 67.08-44.58	55.46	1.16	7.42	53.576	A	0.000	53.576	53.576	100.00	0.000	0.000
					B	0.000	53.576		100.00	0.000	0.000
					C	0.000	53.576		100.00	0.000	24.479
L6 44.58-34.08	39.26	1.051	6.73	28.623	A	0.000	28.623	28.623	100.00	0.000	0.000
					B	0.000	28.623		100.00	0.000	0.000
					C	0.000	28.623		100.00	0.000	11.811
L7 34.08-18.75	26.27	1	6.40	45.008	A	0.000	45.008	45.008	100.00	0.000	0.000
					B	0.000	45.008		100.00	0.000	0.000
					C	0.000	45.008		100.00	0.000	17.312
L8 18.75-0.00	9.19	1	6.40	61.810	A	0.000	61.810	61.810	100.00	0.000	0.000
					B	0.000	61.810		100.00	0.000	0.000
					C	0.000	61.810		100.00	0.000	21.866

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice

Comb. No.	Description
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	131 - 110	Pole	Max Tension	8	0	0	0
			Max. Compression	14	-7	1	0
			Max. Mx	11	-2	57	0
			Max. My	8	-2	0	-57
			Max. Vy	11	-5	57	0
			Max. Vx	8	5	0	-57
			Max. Torque	9			0
L2	110 - 84.5833	Pole	Max Tension	1	0	0	0
			Max. Compression	14	-28	3	0
			Max. Mx	11	-9	376	3
			Max. My	2	-9	3	380
			Max. Vy	11	-18	376	3
			Max. Vx	8	18	-2	-379
			Max. Torque	11			-1
L3	84.5833 - 70	Pole	Max Tension	1	0	0	0
			Max. Compression	14	-32	5	-1
			Max. Mx	11	-10	571	5
			Max. My	8	-10	-3	-576
			Max. Vy	11	-19	571	5
			Max. Vx	8	19	-3	-576
			Max. Torque	11			-1
L4	70 - 67.0833	Pole	Max Tension	1	0	0	0
			Max. Compression	14	-35	7	-2
			Max. Mx	11	-12	705	6

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	8	-12	-4	-711
			Max. Vy	11	-20	705	6
			Max. Vx	8	20	-4	-711
			Max. Torque	11			-1
L5	67.0833 - 44.5833	Pole	Max Tension	1	0	0	0
			Max. Compression	14	-45	12	-5
			Max. Mx	11	-16	1176	9
			Max. My	8	-16	-6	-1185
			Max. Vy	11	-22	1176	9
			Max. Vx	8	22	-6	-1185
			Max. Torque	11			-1
L6	44.5833 - 34.08	Pole	Max Tension	1	0	0	0
			Max. Compression	14	-47	14	-6
			Max. Mx	11	-18	1301	9
			Max. My	8	-18	-6	-1311
			Max. Vy	11	-23	1301	9
			Max. Vx	8	23	-6	-1311
			Max. Torque	11			-1
L7	34.08 - 18.75	Pole	Max Tension	1	0	0	0
			Max. Compression	14	-57	19	-9
			Max. Mx	11	-23	1784	12
			Max. My	8	-23	-8	-1796
			Max. Vy	11	-25	1784	12
			Max. Vx	8	25	-8	-1796
			Max. Torque	11			-1
L8	18.75 - 0	Pole	Max Tension	1	0	0	0
			Max. Compression	14	-65	25	-13
			Max. Mx	11	-28	2267	14
			Max. My	8	-28	-9	-2282
			Max. Vy	11	-27	2267	14
			Max. Vx	8	27	-9	-2282
			Max. Torque	11			-1

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	65	0	0
	Max. H_x	11	28	27	0
	Max. H_z	2	28	0	27
	Max. M_x	2	2275	0	27
	Max. M_z	5	2253	-27	0
	Max. Torsion	5	1	-27	0
	Min. Vert	8	28	0	-27
	Min. H_x	5	28	-27	0
	Min. H_z	8	28	0	-27
	Min. M_x	8	-2282	0	-27
	Min. M_z	11	-2267	27	0
	Min. Torsion	11	-1	27	0

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	28	0	0	1	3	0
Dead+Wind 0 deg - No Ice	28	0	-27	-2275	22	0

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 30 deg - No Ice	28	13	-23	-1966	-1118	-1
Dead+Wind 60 deg - No Ice	28	23	-13	-1131	-1949	-1
Dead+Wind 90 deg - No Ice	28	27	0	9	-2253	-1
Dead+Wind 120 deg - No Ice	28	23	14	1156	-1950	0
Dead+Wind 150 deg - No Ice	28	13	23	1981	-1132	0
Dead+Wind 180 deg - No Ice	28	0	27	2282	-9	0
Dead+Wind 210 deg - No Ice	28	-13	23	1978	1122	1
Dead+Wind 240 deg - No Ice	28	-23	13	1135	1958	1
Dead+Wind 270 deg - No Ice	28	-27	0	-14	2267	1
Dead+Wind 300 deg - No Ice	28	-23	-14	-1150	1964	1
Dead+Wind 330 deg - No Ice	28	-13	-23	-1976	1143	0
Dead+Ice+Temp	65	0	0	13	25	0
Dead+Wind 0 deg+Ice+Temp	65	0	-9	-781	30	0
Dead+Wind 30 deg+Ice+Temp	65	4	-8	-674	-368	0
Dead+Wind 60 deg+Ice+Temp	65	8	-4	-383	-658	0
Dead+Wind 90 deg+Ice+Temp	65	9	0	15	-764	0
Dead+Wind 120 deg+Ice+Temp	65	8	4	414	-658	0
Dead+Wind 150 deg+Ice+Temp	65	4	8	703	-372	0
Dead+Wind 180 deg+Ice+Temp	65	0	9	808	21	0
Dead+Wind 210 deg+Ice+Temp	65	-4	8	702	417	0
Dead+Wind 240 deg+Ice+Temp	65	-8	4	409	708	0
Dead+Wind 270 deg+Ice+Temp	65	-9	0	9	816	0
Dead+Wind 300 deg+Ice+Temp	65	-8	-4	-388	710	0
Dead+Wind 330 deg+Ice+Temp	65	-4	-8	-677	422	0
Dead+Wind 0 deg - Service	28	0	-10	-889	11	0
Dead+Wind 30 deg - Service	28	5	-9	-768	-435	0
Dead+Wind 60 deg - Service	28	9	-5	-442	-760	0
Dead+Wind 90 deg - Service	28	10	0	4	-879	0
Dead+Wind 120 deg - Service	28	9	5	453	-761	0
Dead+Wind 150 deg - Service	28	5	9	776	-441	0
Dead+Wind 180 deg - Service	28	0	10	894	-1	0
Dead+Wind 210 deg - Service	28	-5	9	775	441	0
Dead+Wind 240 deg - Service	28	-9	5	445	768	0
Dead+Wind 270 deg - Service	28	-10	0	-5	889	0
Dead+Wind 300 deg - Service	28	-9	-5	-449	771	0
Dead+Wind 330 deg - Service	28	-5	-9	-772	449	0

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0	-28	0	0	28	0	0.001%
2	0	-28	-27	0	28	27	0.012%
3	13	-28	-23	-13	28	23	0.000%
4	23	-28	-13	-23	28	13	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
5	27	-28	0	-27	28	0	0.012%
6	23	-28	14	-23	28	-14	0.000%
7	13	-28	23	-13	28	-23	0.000%
8	0	-28	27	0	28	-27	0.012%
9	-13	-28	23	13	28	-23	0.000%
10	-23	-28	13	23	28	-13	0.000%
11	-27	-28	0	27	28	0	0.006%
12	-23	-28	-14	23	28	14	0.000%
13	-13	-28	-23	13	28	23	0.000%
14	0	-65	0	0	65	0	0.001%
15	0	-65	-9	0	65	9	0.002%
16	4	-65	-8	-4	65	8	0.002%
17	8	-65	-4	-8	65	4	0.002%
18	9	-65	0	-9	65	0	0.002%
19	8	-65	4	-8	65	-4	0.002%
20	4	-65	8	-4	65	-8	0.002%
21	0	-65	9	0	65	-9	0.002%
22	-4	-65	8	4	65	-8	0.001%
23	-8	-65	4	8	65	-4	0.002%
24	-9	-65	0	9	65	0	0.002%
25	-8	-65	-4	8	65	4	0.002%
26	-4	-65	-8	4	65	8	0.002%
27	0	-28	-10	0	28	10	0.006%
28	5	-28	-9	-5	28	9	0.004%
29	9	-28	-5	-9	28	5	0.004%
30	10	-28	0	-10	28	0	0.006%
31	9	-28	5	-9	28	-5	0.004%
32	5	-28	9	-5	28	-9	0.004%
33	0	-28	10	0	28	-10	0.006%
34	-5	-28	9	5	28	-9	0.004%
35	-9	-28	5	9	28	-5	0.004%
36	-10	-28	0	10	28	0	0.006%
37	-9	-28	-5	9	28	5	0.004%
38	-5	-28	-9	5	28	9	0.004%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	17	0.00010908	0.00012622
3	Yes	23	0.00000001	0.00009055
4	Yes	23	0.00000001	0.00009267
5	Yes	17	0.00010928	0.00013953
6	Yes	23	0.00000001	0.00009169
7	Yes	23	0.00000001	0.00009408
8	Yes	17	0.00010905	0.00011719
9	Yes	23	0.00000001	0.00009247
10	Yes	23	0.00000001	0.00009036
11	Yes	18	0.00006111	0.00011683
12	Yes	23	0.00000001	0.00009550
13	Yes	23	0.00000001	0.00009285
14	Yes	15	0.00000001	0.00002655
15	Yes	20	0.00010812	0.00008730
16	Yes	20	0.00010781	0.00013285
17	Yes	20	0.00010781	0.00013541
18	Yes	20	0.00010816	0.00008457
19	Yes	20	0.00010769	0.00014101
20	Yes	20	0.00010767	0.00013980
21	Yes	20	0.00010798	0.00008920
22	Yes	21	0.00006340	0.00009210
23	Yes	20	0.00010752	0.00014938
24	Yes	20	0.00010795	0.00008979
25	Yes	20	0.00010760	0.00014744
26	Yes	20	0.00010762	0.00014870

27	Yes	17	0.00011686	0.00006132
28	Yes	18	0.00006540	0.00013191
29	Yes	18	0.00006540	0.00014105
30	Yes	17	0.00011689	0.00006489
31	Yes	18	0.00006537	0.00013170
32	Yes	18	0.00006536	0.00014279
33	Yes	17	0.00011683	0.00006138
34	Yes	18	0.00006536	0.00013979
35	Yes	18	0.00006536	0.00013034
36	Yes	17	0.00011684	0.00006877
37	Yes	18	0.00006535	0.00014834
38	Yes	18	0.00006535	0.00013687

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	131 - 110	44.18	38	3.041	0.006
L2	110 - 84.5833	31.02	38	2.854	0.006
L3	84.5833 - 70	17.64	38	2.074	0.003
L4	74 - 67.0833	13.38	38	1.770	0.002
L5	67.0833 - 44.5833	10.90	38	1.632	0.002
L6	44.5833 - 34.08	4.71	33	1.006	0.001
L7	39 - 18.75	3.62	33	0.860	0.001
L8	18.75 - 0	0.81	33	0.423	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
128.00	APX18-206517S-C w/ Mount Pipe	38	42.25	3.030	0.006	11975
121.00	800 10121 w/ Mount Pipe	38	37.80	2.993	0.006	5987
119.00	(2) RRUS-11	38	36.54	2.978	0.006	4989
107.00	BXA-70063/6CFx4 w/ Mount Pipe	38	29.25	2.788	0.006	2571
101.00	VHLP2.5-11	38	25.84	2.625	0.005	2139
97.00	TIMING 2000	38	23.68	2.498	0.005	1920
95.00	(2) PCS 1900MHz 4x45W-65MHz	38	22.63	2.431	0.005	1827
87.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	38	18.73	2.156	0.004	1541

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	131 - 110	112.33	8	7.743	0.016
L2	110 - 84.5833	78.96	8	7.268	0.015
L3	84.5833 - 70	44.97	13	5.289	0.009
L4	74 - 67.0833	34.12	13	4.514	0.006
L5	67.0833 - 44.5833	27.80	13	4.163	0.005
L6	44.5833 - 34.08	12.01	13	2.569	0.002
L7	39 - 18.75	9.23	13	2.195	0.002
L8	18.75 - 0	2.08	13	1.081	0.001

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
128.00	APX18-206517S-C w/ Mount Pipe	8	107.46	7.715	0.016	4890
121.00	800 10121 w/ Mount Pipe	8	96.16	7.622	0.016	2443
119.00	(2) RRUS-11	8	92.96	7.581	0.016	2035
107.00	BXA-70063/6CFx4 w/ Mount Pipe	8	74.46	7.102	0.014	1043
101.00	VHLP2.5-11	8	65.80	6.686	0.013	863
97.00	TIMING 2000	13	60.30	6.364	0.012	773
95.00	(2) PCS 1900MHz 4x45W-65MHz	13	57.65	6.194	0.012	735
87.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	13	47.72	5.496	0.009	618

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	131 - 110 (1)	TP15.525x10.525x0.188	21.00	0.00	0.0	39.00	9.284	-2	362	0.005
L2	110 - 84.5833 (2)	TP21.883x15.525x0.25	25.42	0.00	0.0	39.00	17.415	-9	679	0.013
L3	84.5833 - 70 (3)	TP25.531x21.883x0.378	14.58	0.00	0.0	37.54	29.392	-10	1103	0.009
L4	70 - 67.0833 (4)	TP25.76x23.775x0.436	6.92	0.00	0.0	37.60	35.535	-12	1336	0.009
L5	67.0833 - 44.5833 (5)	TP31.388x25.76x0.411	22.50	0.00	0.0	37.81	40.987	-16	1550	0.011
L6	44.5833 - 34.08 (6)	TP34.015x31.388x0.406	10.50	0.00	0.0	37.82	42.354	-18	1602	0.011
L7	34.08 - 18.75 (7)	TP37.216x31.972x0.425	20.25	0.00	0.0	37.93	48.218	-21	1829	0.012
L8	18.75 - 0 (8)	TP41.9x37.216x0.408	18.75	0.00	0.0	37.98	50.700	-25	1926	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	131 - 110 (1)	TP15.525x10.525x0.188	57	19.87	39.00	0.510	0	0.00	39.00	0.000
L2	110 - 84.5833 (2)	TP21.883x15.525x0.25	381	49.77	39.00	1.276	0	0.00	39.00	0.000
L3	84.5833 - 70 (3)	TP25.531x21.883x0.378	577	40.19	37.54	1.071	0	0.00	37.54	0.000
L4	70 - 67.0833 (4)	TP25.76x23.775x0.436	712	39.19	37.60	1.042	0	0.00	37.60	0.000
L5	67.0833 -	TP31.388x25.76x0.411	1186	46.10	37.81	1.219	0	0.00	37.81	0.000

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L6	44.5833 (5) 44.5833 - 34.08 (6)	TP34.015x31.388x0.406	1312	47.19	37.82	1.248	0	0.00	37.82	0.000
L7	34.08 - 18.75 (7)	TP37.216x31.972x0.425	1646	47.80	37.93	1.260	0	0.00	37.93	0.000
L8	18.75 - 0 (8)	TP41.9x37.216x0.408	1982	49.80	37.98	1.311	0	0.00	37.98	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	131 - 110 (1)	TP15.525x10.525x0.188	5	0.56	26.00	0.044	0	0.03	26.00	0.001
L2	110 - 84.5833 (2)	TP21.883x15.525x0.25	18	1.03	26.00	0.081	1	0.06	26.00	0.002
L3	84.5833 - 70 (3)	TP25.531x21.883x0.378	19	0.65	25.03	0.053	1	0.03	25.03	0.001
L4	70 - 67.0833 (4)	TP25.76x23.775x0.436	20	0.56	25.06	0.045	1	0.02	25.06	0.001
L5	67.0833 - 44.5833 (5)	TP31.388x25.76x0.411	22	0.54	25.20	0.044	1	0.01	25.20	0.000
L6	44.5833 - 34.08 (6)	TP34.015x31.388x0.406	23	0.54	25.22	0.044	1	0.01	25.22	0.000
L7	34.08 - 18.75 (7)	TP37.216x31.972x0.425	24	0.51	25.29	0.040	0	0.00	25.29	0.000
L8	18.75 - 0 (8)	TP41.9x37.216x0.408	26	0.51	25.32	0.041	0	0.00	25.32	0.000

Pole Interaction Design Data

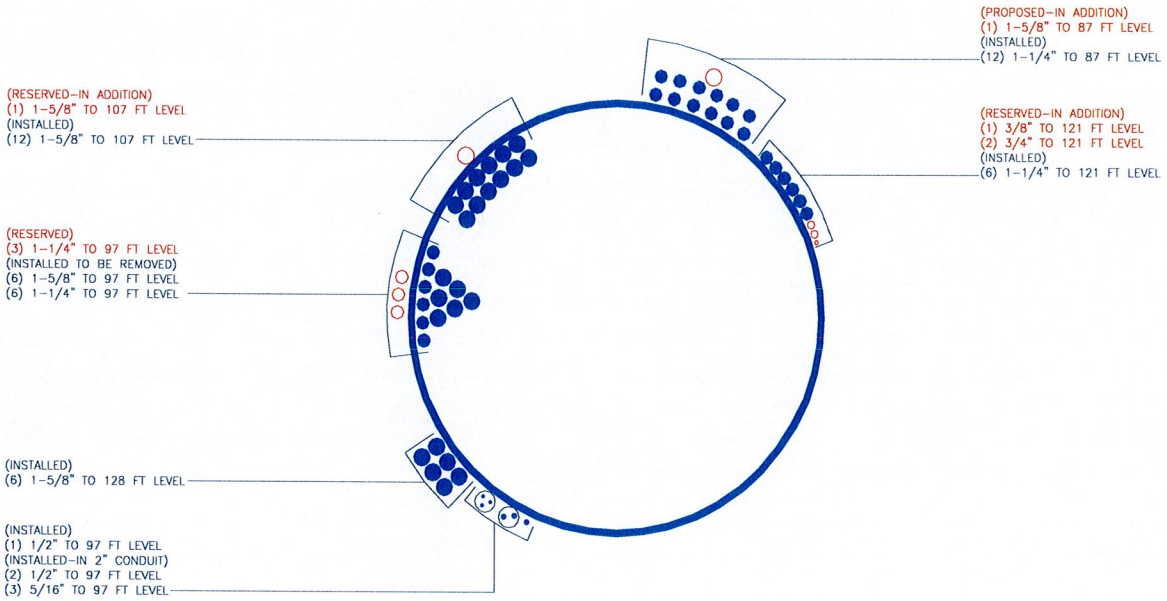
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	131 - 110 (1)	0.005	0.510	0.000	0.044	0.001	0.516 ✔	1.333	H1-3+VT ✔
L2	110 - 84.5833 (2)	0.013	1.276	0.000	0.081	0.002	1.291 ✔	1.333	H1-3+VT ✔
L3	84.5833 - 70 (3)	0.009	1.071	0.000	0.053	0.001	1.081 ✔	1.333	H1-3+VT ✔
L4	70 - 67.0833 (4)	0.009	1.042	0.000	0.045	0.001	1.052 ✔	1.333	H1-3+VT ✔
L5	67.0833 - 44.5833 (5)	0.011	1.219	0.000	0.044	0.000	1.231 ✔	1.333	H1-3+VT ✔
L6	44.5833 - 34.08 (6)	0.011	1.248	0.000	0.044	0.000	1.259 ✔	1.333	H1-3+VT ✔
L7	34.08 - 18.75 (7)	0.012	1.260	0.000	0.040	0.000	1.272 ✔	1.333	H1-3+VT ✔
L8	18.75 - 0 (8)	0.013	1.311	0.000	0.041	0.000	1.324 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	131 - 110	Pole	TP15.525x10.525x0.188	1	-2	483	38.7	Pass
L2	110 - 84.5833	Pole	TP21.883x15.525x0.25	2	-9	905	96.8	Pass
L3	84.5833 - 70	Pole	TP25.531x21.883x0.378	3	-10	1471	81.1	Pass
L4	70 - 67.0833	Pole	TP25.76x23.775x0.436	4	-12	1781	78.9	Pass
L5	67.0833 - 44.5833	Pole	TP31.388x25.76x0.411	5	-16	2066	92.3	Pass
L6	44.5833 - 34.08	Pole	TP34.015x31.388x0.406	6	-18	2135	94.5	Pass
L7	34.08 - 18.75	Pole	TP37.216x31.972x0.425	7	-21	2438	95.4	Pass
L8	18.75 - 0	Pole	TP41.9x37.216x0.408	8	-25	2567	99.4	Pass
							Summary	
						Pole (L8)	99.4	Pass
						RATING =	**99.4**	**Pass**

APPENDIX B

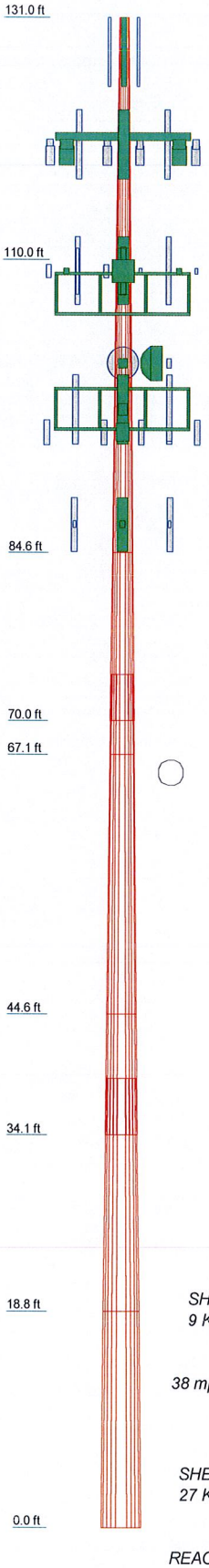
BASE LEVEL DRAWING

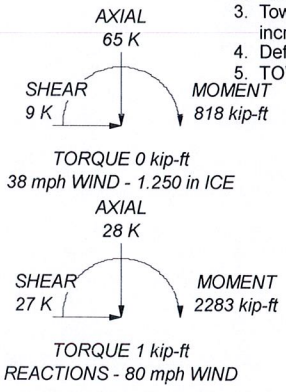

(PROPOSED-IN ADDITION)
(1) 1-5/8" TO 87 FT LEVEL
(INSTALLED)
(12) 1-1/4" TO 87 FT LEVEL
(RESERVED-IN ADDITION)
(1) 1-5/8" TO 107 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 107 FT LEVEL
(RESERVED-IN ADDITION)
(1) 3/8" TO 121 FT LEVEL
(2) 3/4" TO 121 FT LEVEL
(INSTALLED)
(6) 1-1/4" TO 121 FT LEVEL
(RESERVED)
(3) 1-1/4" TO 97 FT LEVEL
(INSTALLED TO BE REMOVED)
(6) 1-5/8" TO 97 FT LEVEL
(6) 1-1/4" TO 97 FT LEVEL
(INSTALLED)
(6) 1-5/8" TO 128 FT LEVEL
(INSTALLED)
(1) 1/2" TO 97 FT LEVEL
(INSTALLED-IN 2" CONDUIT)
(2) 1/2" TO 97 FT LEVEL
(3) 5/16" TO 97 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Section	1	2	3	4	5	6	7	8
Length (ft)	21.00	25.42	14.58 / 6.92		22.50	10.50	20.25	18.75
Number of Sides	12	12	12	12	12	12	12	12
Thickness (in)	0.188	0.250	0.378	0.436	0.411	0.406	0.425	0.408
Socket Length (ft)			4.00			4.92		
Top Dia (in)	10.525	15.525	21.883	23.775	25.760	31.388	31.972	37.216
Bot Dia (in)	15.525	21.883	25.531	25.760	31.388	34.015	37.216	41.900
Grade	A572-65		Reinf 62.57 ksi	Reinf 62.66 ksi	Reinf 63.01 ksi	Reinf 63.04 ksi	Reinf 63.22 ksi	Reinf 63.30 ksi
Weight (K)	0.6	1.3	1.4	0.8	2.9	1.5	3.2	3.3





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APX18-206517S-C w/ Mount Pipe	128	Platform Mount (LP 101-1)	107
APX18-206517S-C w/ Mount Pipe	128	TIMING 2000	97
APX18-206517S-C w/ Mount Pipe	128	840 10054 w/ Mount Pipe	97
Pipe Mount [PM 601-3]	128	840 10054 w/ Mount Pipe	97
800 10121 w/ Mount Pipe	121	840 10054 w/ Mount Pipe	97
800 10121 w/ Mount Pipe	121	WIMAX DAP HEAD	97
800 10121 w/ Mount Pipe	121	WIMAX DAP HEAD	97
(2) LGP21401	121	WIMAX DAP HEAD	97
(2) LGP21401	121	HORIZON COMPACT	97
(2) LGP21401	121	HORIZON COMPACT	97
AM-X-CD-16-65-00T-RET w/ Mount Pipe	121	APXVSPP18-C-A20 w/ Mount Pipe	97
		APXVSPP18-C-A20 w/ Mount Pipe	97
AM-X-CD-16-65-00T-RET w/ Mount Pipe	121	APXVSPP18-C-A20 w/ Mount Pipe	97
		IBC1900HG-2A	97
AM-X-CD-16-65-00T-RET w/ Mount Pipe	121	IBC1900HG-2A	97
		IBC1900HG-2A	97
DC6-48-60-18-8F	121	IBC1900BB-1	97
T-Arm Mount [TA 601-3]	121	IBC1900BB-1	97
(2) RRUS-11	119	IBC1900BB-1	97
(2) RRUS-11	119	Platform Mount [LP 602-1]	97
(2) RRUS-11	119	VHLP2.5-11	97
Side Arm Mount [SO 102-3]	119	VHLP2.5-11	97
BXA-70063/6CFx4 w/ Mount Pipe	107	(2) PCS 1900MHz 4x45W-65MHz	95
BXA-70063/6CFx4 w/ Mount Pipe	107	800MHz 2X50W RRH W/FILTER	95
BXA-70063/6CFx4 w/ Mount Pipe	107	800MHz 2X50W RRH W/FILTER	95
BXA-185090/8CF w/ Mount Pipe	107	800MHz 2X50W RRH W/FILTER	95
BXA-185090/8CF w/ Mount Pipe	107	Side Arm Mount [SO 101-3]	95
BXA-185060/8CFx2 w/ Mount Pipe	107	(2) PCS 1900MHz 4x45W-65MHz	95
(2) FD9R6004/1C-3L	107	(2) PCS 1900MHz 4x45W-65MHz	95
(2) FD9R6004/1C-3L	107	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	87
(2) FD9R6004/1C-3L	107		
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	107	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	87
BXA-80063/4CF w/ Mount Pipe	107	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	87
BXA-80063/4CF w/ Mount Pipe	107		
BXA-80063/4CF w/ Mount Pipe	107	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	87
BXA-171085-8CF-EDIN-2 w/ Mount Pipe	107		
		KRY 112 144/1	87
BXA-171085-8CF-EDIN-2 w/ Mount Pipe	107	KRY 112 144/1	87
		KRY 112 144/1	87
BXA-171085-8CF-EDIN-2 w/ Mount Pipe	107	Side Arm Mount [SO 702-3]	87
		ERICSSON AIR 21 B2A B4P w/ Mount Pipe	87
RRH2x40-AWS	107		
RRH2x40-AWS	107	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	87
RRH2x40-AWS	107		
DB-T1-6Z-8AB-0Z	107		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	Reinf 63.04 ksi	63 ksi	79 ksi
Reinf 62.57 ksi	63 ksi	79 ksi	Reinf 63.22 ksi	63 ksi	80 ksi
Reinf 62.66 ksi	63 ksi	79 ksi	Reinf 63.30 ksi	63 ksi	80 ksi
Reinf 63.01 ksi	63 ksi	79 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.25 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 99.4%

Paul J Ford and Company
250 E. Broad Street Suite 1500
Columbus, OH 43215
Phone: 614.221.6679
FAX: 614.448.44105

Job: *131-Ft Monopole / HRT 100 943239*			
Project: *PJF 37513-0342 / BU 806376*			
Client: Crown Castle	Drawn by: Robert Koors	App'd:	
Code: TIA/EIA-222-F	Date: 02/26/13	Scale: NTS	
Path: T:\375_Crown Castle\37513-0342 BU 806376\WO 581319 BU 806376 - BP R1\37513-0342 BP R1_CROWN Reinforced.eri		Dwg No. E-1	

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev F

Site Data

BU#: *806376*
Site Name:
App #:

Pole Manufacturer:	*Other*

Reactions		
Moment:	2283	ft-kips
Axial:	28	kips
Shear:	27	kips

Anchor Rod Data		
Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	49.88	in

Plate Data		
Diam:	55.88	in
Thick:	2.5	in
Grade:	60	ksi
Single-Rod B-eff:	11.23	in

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	41.9	in
Thick:	0.344	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

If No stiffeners, Criteria:	AISC ASD	<-Only Applcable to Unstiffened Cases

Anchor Rod Results

		Rigid
Maximum Rod Tension:	180.7 Kips	Service, ASD
Allowable Tension:	195.0 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	92.7% Pass	

Base Plate Results Flexural Check

		Rigid
Base Plate Stress:	39.9 ksi	Service ASD
Allowable Plate Stress:	60.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	66.5% Pass	Y.L. Length: 27.06

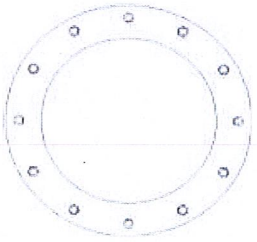
n/a

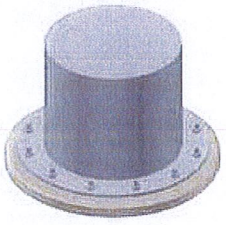
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *806376*
Site Name:
App #:

Pole Manufacturer:	Other

Reactions		
Moment:	57	ft-kips
Axial:	2	kips
Shear:	5	kips
Elevation:	110	feet

If No stiffeners, Criteria:	AISC ASD	<-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	10		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	75	<-- Disregard	Bolt Fty: 44.00
N/A:	55	<-- Disregard	
Circle (in.):	19.45		

Plate Data		
Diam:	21.95	in
Thick, t:	1.375	in
Grade (Fy):	50	ksi
Strength, Fu:	65	ksi
Single-Rod B-eff:	4.99	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	15.53	in
Thick:	0.1875	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

Bolt Tension Capacity, **B**:	46.07	kips	Rigid
Max Bolt directly applied T:	13.87	Kips	Service, ASD
Min. PL "tc" for **B** cap. **w/o** Pry:	1.286	in	Fty*ASIF
Min PL "treq" for actual **T w/ Pry**:	0.529	in	
Min PL "t1" for actual **T w/o Pry**:	0.706	in	
T allowable w/o Prying:	46.07	kips	α'<0 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	13.87	kips	
Non-Prying Bolt Stress Ratio, T/B:	30.1%	**Pass**	

Exterior Flange Plate Results Flexural Check

Compression Side Plate Stress:	10.9	ksi	Rigid
Allowable Plate Stress:	50.0	ksi	Service ASD
Compression Plate Stress Ratio:	21.8%	**Pass**	0.75*Fy*ASIF
No Prying			Comp. Y.L. Length:
Tension Side Stress Ratio, (treq/t)^2:	14.8%	**Pass**	11.71

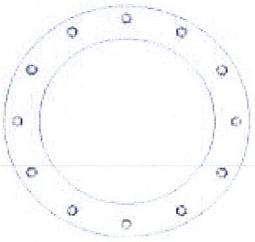
n/a

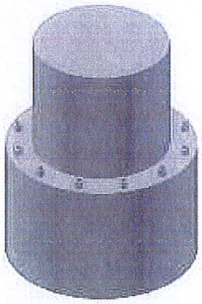
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

PJF job no. **37513-0342 BP R1** Project name **131' Monopole**

Foundation Loads:

Pole weight or tower leg compression =	28	(kips)
Horizontal load at top of pier =	27	(kips)
Overturning moment at top of pier=	2283	(ft-kips)

Design criteria:

Safety factor against overturning =	1.5	

Soil Properties:

Soil density =	115	(pcf)
Allowable soil bearing =	5	(ksf)
Depth to water table =	12	(ft)

Dimensions:

Pier shape (round or square)	R	("R" or "S")
Pier width =	6	(ft)
Pier height above grade =	0.5	(ft)
depth to bottom of footing =	8	(ft)
Footing thickness =	3	(ft)
Footing width =	22	(ft)
Footing length =	22	(ft)

Concrete:

Concrete strength =	3	(ksi)
Rebar strength =	60	(ksi)
ultimate load factor =	1.3	

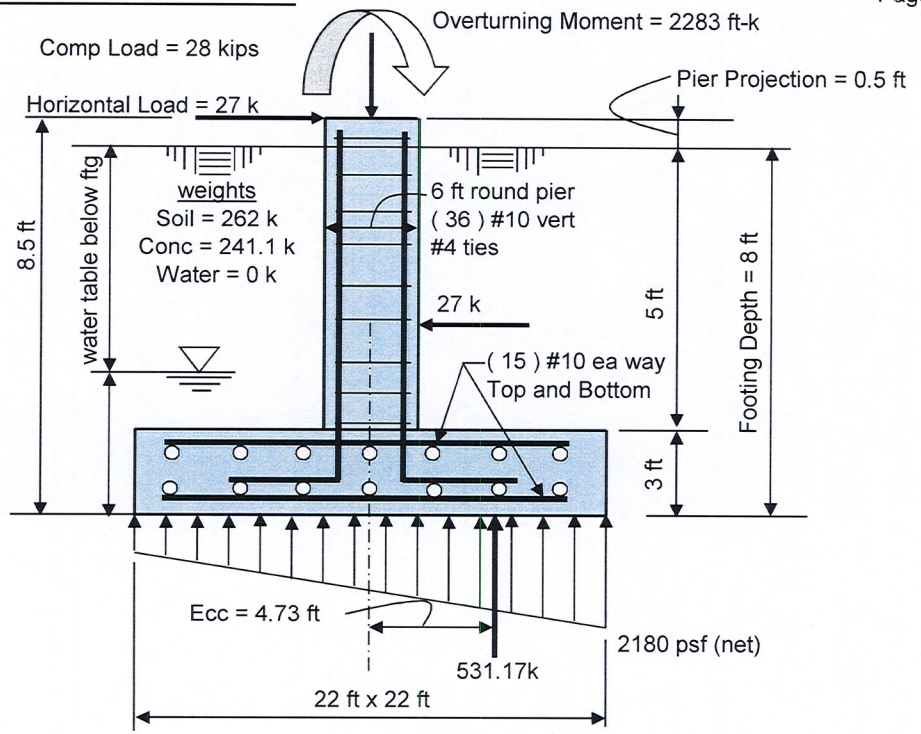
Reinforcing Steel:

	Pad	
minimum cover over rebar =	3	inches
size of pad rebar =	#10	bar
quantity of pad rebar =	15	(ea direction)

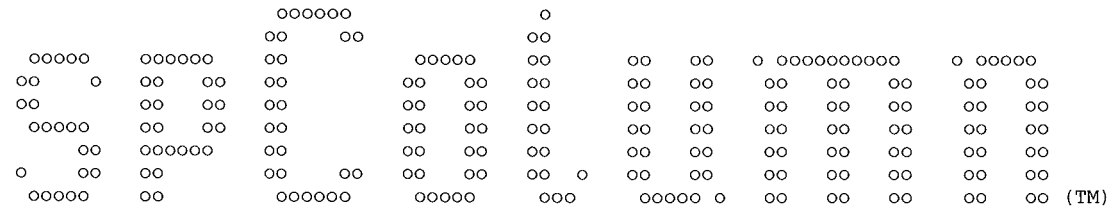
Reinforcing Steel:

	Pier	
size of vert rebar in pier=	#10	bar
vertical rebar quantity =	36	
size of pier ties =	#4	bar
minimum cover over rebar =	3	inches

Total volume of concrete = 59.5 cu yd



Summary of analysis results	
Maximum Net Soil Bearing = 2.18 ksf Allowable Net Soil Bearing = 5 ksf **Soil Bearing Stress Ratio = 0.44 Okay**	Ult Bending Shear Capacity = 110 psi Ult Bending Shear Stress = 30 psi **Bending Shear Stress Ratio = 0.27 Okay**
Ftg Overturning Resistance = 5843 ft-kips Overturning Moment = 2513 ft-kips Required Overturning Safety Factor = 1.5 Overturning Safety Factor = 2.326 **Ratio = 0.65 Okay**	Pad Bending Moment Capacity= 2595 ft-k Pad Bending Moment = 1078 ft-k **Bending Moment Stress Ratio = 0.42 OK**



spColumn v4.80 (TM)
Computer program for the Strength Design of Reinforced Concrete Sections

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General Information:

File Name: T:\375_Crown_Castle\2013\37513-0342 BU 806376\WO 581319 BU 806376...\37513-0342 BP R1.col
Project: 37512-1659
Column:
Code: ACI 318-08
Engineer: DSK
Units: English

Run Option: Investigation
Run Axis: X-axis
Slenderness: Not considered
Column Type: Structural

Material Properties:

f'c = 3 ksi
Ec = 3122.02 ksi
fy = 60 ksi
Es = 29000 ksi
Ultimate strain = 0.003 in/in
Beta1 = 0.85

Section:

Circular: Diameter = 72 in

Gross section area, Ag = 4071.5 in^2
Ix = 1.31917e+006 in^4
Iy = 1.31917e+006 in^4
rx = 18 in
ry = 18 in
Xo = 0 in
Yo = 0 in

Reinforcement:

Bar Set: ASTM A615

Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)
# 3	0.38	0.11	# 4	0.50	0.20	# 5	0.63	0.31
# 6	0.75	0.44	# 7	0.88	0.60	# 8	1.00	0.79
# 9	1.13	1.00	# 10	1.27	1.27	# 11	1.41	1.56
# 14	1.69	2.25	# 18	2.26	4.00			

Confinement: Tied; #3 ties with #10 bars, #4 with larger bars.
phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.65

Layout: Circular
Pattern: All Sides Equal (Cover to longitudinal reinforcement)
Total steel area: As = 45.72 in^2 at rho = 1.12%
Minimum clear spacing = 4.37 in

36 #10 Cover = 3 in

Factored Loads and Moments with Corresponding Capacities:

No.	Pu kip	Mux k-ft	PhiMnx k-ft	PhiMn/Mu	NA depth in	Dt depth in	eps_t	Phi
1	28.00	3241.19	5788.38	1.786	15.56	68.37	0.01018	0.900

*** End of output ***

CROWN CASTLE PROJECT: BU #806376; HRT 100 943239; EAST HARTFORD, CT
MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 1/22/2009)

UPON THE SUCCESSFUL AND COMPLETE INSTALLATION OF THE REINFORCING SYSTEM SPECIFIED IN THESE PLANS, THE REINFORCED POLE MEETS THE WIND DESIGN RECOMMENDATIONS OF THE TIA/EIA-222-F-1996 STANDARD FOR WIND SPEEDS OF 80 MPH AND 38 MPH + 1/4" RADIAL ICE

A. GENERAL NOTES

1. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO FABRICATION AND CONSTRUCTION. THESE DRAWINGS WERE PREPARED FROM INFORMATION AND DOCUMENTS PROVIDED TO PAUL J. FORD & COMPANY BY CROWN CASTLE. THIS INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY PAUL J. FORD & COMPANY FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANTICIPATED. ANY DISCREPANCIES AND/OR CHANGES BETWEEN THE INFORMATION CONTAINED IN THESE DRAWINGS AND THE ACTUAL VERIFIED SITE CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF CROWN CASTLE AND PAUL J. FORD & COMPANY SO THAT ANY CHANGES AND/OR ADJUSTMENTS, IF NECESSARY, CAN BE MADE TO THE DESIGN AND DRAWINGS.
2. THE EXISTING UNREINFORCED MONOPOLE STRUCTURE DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE ANTENNA AND PLATFORM LOADS SHOWN ON THESE DRAWINGS AT THE REQUIRED MINIMUM TIA/EIA-222-F-1996 BASIC WIND SPEEDS. DO NOT INSTALL ANY ADDITIONAL OR NEW ANTENNA AND PLATFORM LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
3. IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.
4. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCING REPAIR SYSTEM HAS BEEN PROPERLY AND ADEQUATELY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO INSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT. IMPORTANT CUTTING, WELDING AND SAFETY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE PREVENTION AND SAFETY GUIDELINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES FROM CROWN CASTLE. PER THE 12-01-2005 CROWN CASTLE DIRECTIVE: "ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY 'CUTTING AND WELDING PLAN' (DOC # ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT".
5. THE STRUCTURAL CONTRACT DOCUMENTS DO NOT INDICATE THE METHOD OR MEANS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE OWNER AND/OR THE ENGINEER SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES.
6. ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY THE INSPECTION/TESTING AGENCY. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
7. ALL MATERIALS AND EQUIPMENT FURNISHED WILL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO INSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.
10. ANY EXISTING ATTACHMENTS AND/OR PROJECTIONS ON THE POLE THAT MAY INTERFERE WITH THE INSTALLATION OF THE REINFORCING SYSTEM WILL HAVE TO BE REMOVED, AND/OR RELOCATED, AND/OR REPLACED AND RE-INSTALLED AFTER THE REINFORCING IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND COORDINATE THESE ITEMS PRIOR TO CONSTRUCTION WITH THE OWNER, TESTING AGENCY, AND ENGINEER.
11. ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFT REINFORCING MUST BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SUPPORTED TO PERMIT NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM, THE CONTRACTOR SHALL RE-INSTALL THE PLATFORMS. IN NO CASE SHALL ANY NEW AND/OR ADDITIONAL PLATFORMS AND/OR ANTENNAS AND/OR COAX CABLES AND/OR OTHER EQUIPMENT BE INSTALLED ON THE MONOPOLE UNTIL THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF ALL OF THE REQUIRED STRUCTURAL REINFORCING SYSTEM COMPONENTS.

B. "LOW HEAT" WELDING PROCEDURES - (NOT REQUIRED)

C. SPECIAL INSPECTION AND TESTING

1. ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY THE OWNER'S REPRESENTATIVE AND THE OWNER'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY. REFER TO CROWN CASTLE DOCUMENT ENG-SOW-10066 FOR SPECIFICATION.
2. ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE PERFORMED SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
3. OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
4. AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY THE OWNER FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
   (A.) ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
   (B.) THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
5. THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES FOR THE OWNER. THE TESTING AGENCY SHALL INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.
   A. GENERAL:
      (1.) PERFORM CONTINUOUS ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY OWNER IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.
   B. FOUNDATIONS, CONCRETE, AND SOIL PREPARATION - (NOT REQUIRED)
   C. CONCRETE TESTING PER ACI - (NOT REQUIRED)
   D. STRUCTURAL STEEL
      (1.) CHECK THE STEEL ON THE JOB WITH THE PLANS.
      (2.) CHECK MILL CERTIFICATIONS.
      (3.) CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
      (4.) INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
      (5.) CALL FOR LABORATORY TEST REPORTS WHEN IN DOUBT.
      (6.) CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
      (7.) CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
      (8.) CHECK BOLT TIGHTENING ACCORDING TO AISC "TURN OF THE NUT" METHOD.
   E. WELDING:
      (1.) VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
      (2.) INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND IN ACCORDANCE WITH AWS D1.1.
      (3.) APPROVE FIELD WELDING SEQUENCE.
         (A.) A PROGRAM OF THE APPROVED SEQUENCES SHALL BE SUBMITTED TO THE OWNER BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISSION FROM THE OWNER.
      (4.) INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
         (A.) INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE AND WORKING CONDITIONS.
         (B.) VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
         (C.) INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
         (D.) VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1.
         (E.) SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE OR DYE PENETRANT.
         (F.) INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED PLANS.
         (G.) VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
         (H.) REVIEW THE REPORTS BY TESTING LABS.
         (I.) CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
         (J.) INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
         (K.) CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.
   F. SPECIAL INSPECTION OF EXISTING SHAFT-TO-FLANGE WELD CONNECTIONS - (NOT REQUIRED)
   G. REPORTS:
      (1.) COMPILE AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO THE OWNER.
6. THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES AND PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO THE OWNER'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT THE OWNER'S REVIEW AND SPECIFIC WRITTEN CONSENT. THE OWNER RESERVES THE RIGHT TO DETERMINE WHAT IS AN ACCEPTABLE RESOLUTION OF DISCREPANCIES AND PROBLEMS.
7. AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO THE OWNER. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.
8. RESPONSIBILITY: THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.

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BU #806376; HRT 100 943239
EAST HARTFORD, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-0342	ISSUE DATE OF PERMIT: 2-26-2013
DRAWN BY: B.M.S.	
CHECKED BY: R.M.K.	
APPROVED BY:	S-1
DATE: 2-26-2013	

D. **STRUCTURAL STEEL**

1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:

A. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
   (A.) "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
   (B.) "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION.
   (C.) "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (PARAGRAPH 4.2.1 SPECIFICALLY EXCLUDED).

B. BY THE AMERICAN WELDING SOCIETY (AWS):
   (A.) "STRUCTURAL WELDING CODE - STEEL D1.1."
   (B.) "SYMBOLS FOR WELDING AND NON-DESTRUCTIVE TESTING"

2. ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
3. TIGHTEN ALL STRUCTURAL BOLTS, INCLUDING THE AJAX M20 BOLTS WITH SHEAR SLEEVES, ACCORDING TO THE REQUIREMENTS OF THE AISC "TURN OF THE NUT" METHOD. TIGHTEN BOLTS 1/3 TURN PAST THE SNUG TIGHT CONDITION AS DEFINED BY AISC.
4. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E80XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO THE OWNER'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65 (FY = 65 KSI MIN.) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
7. SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS. SEE SECTION I NOTES REGARDING TOUCH-UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS FIELD WELDING.
8. UNLESS OTHERWISE NOTED, ALL STEEL MEMBERS SHALL BE HOT-DIP GALVANIZED, AFTER FABRICATION, IN ACCORDANCE WITH ASTM A123. SEE SECTION J FOR FURTHER NOTES AND FOR EXCEPTIONS (IF ANY).
9. ALL WELDS SHALL BE VISUALLY INSPECTED BY THE OWNER'S APPROVED TESTING AGENCY. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT. THE CONTRACTOR SHALL COOPERATE WITH THE TESTING AGENCY IN THEIR TESTING EFFORTS.
10. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
11. FIELD CUTTING OF STEEL:
   (A.) PRIOR TO ANY FIELD CUTTING, THE CONTRACTOR SHALL MARK THE CUT OUTLINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS.
   (B.) ANY REQUIRED CUTS IN THE STEEL SHALL BE CAREFULLY CUT BY MECHANICAL METHODS SUCH AS DRILLING, SAW CUTTING, AND GRINDING. THE CONTRACTOR IS RESPONSIBLE TO PREVENT ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, DURING THE CUTTING WORK. ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
   (C.) ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.

E. **BASE PLATE GROUT - (NOT REQUIRED)**

F. **FOUNDATION WORK - (NOT REQUIRED)**

G. **CAST-IN-PLACE CONCRETE - (NOT REQUIRED)**

H. **EPOXY GROUTED REINFORCING ANCHOR RODS - (NOT REQUIRED)**

I. **TOUCH UP OF GALVANIZING**

1. THE CONTRACTOR SHALL TOUCH UP ANY AND/OR ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. **GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL FIELD WELDING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-631-3275 FOR PRODUCT INFORMATION.**
2. CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS ON GALVANIZED AND PRIME PAINTED SURFACES FOR TOUCH-UP COATING IN ACCORDANCE WITH AWS D1.1. THE OWNER'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH-UP COATING.
3. THE OWNER'S TESTING AGENCY SHALL TEST AND VERIFY THE COATING THICKNESS AFTER THE CONTRACTOR HAS APPLIED THE ZRC COLD GALVANIZING COMPOUND AND IT HAS SUFFICIENTLY DRIED. AREAS FOUND TO BE INADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

J. **HOT DIP GALVANIZING**

1. HOT-DIP GALVANIZE ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR PER ASTM A153, AS APPROPRIATE.
2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING.
3. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES AS REQUIRED.
4. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

K. **PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER**

1. AFTER THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF THE MONOPOLE REINFORCING SYSTEM AND THE WORK HAS BEEN ACCEPTED BY THE OWNER, THE OWNER WILL BE RESPONSIBLE FOR THE LONG TERM AND PERPETUAL INSPECTION AND MAINTENANCE OF THE POLE AND REINFORCING SYSTEM.
2. THE MONOPOLE REINFORCING SYSTEM INDICATED IN THESE DOCUMENTS USES REINFORCING COMPONENTS THAT INVOLVE FIELD WELDING STEEL MEMBERS TO THE EXISTING GALVANIZED STEEL POLE STRUCTURE. THESE FIELD WELDED CONNECTIONS ARE SUBJECT TO CORROSION DAMAGE AND DETERIORATION IF THEY ARE NOT PROPERLY MAINTAINED AND COVERED WITH CORROSION PREVENTIVE COATING SUCH AS THE ZRC GALVANIZING COMPOUND SPECIFIED PREVIOUSLY. THE STRUCTURAL LOAD CARRYING CAPACITY OF THE REINFORCED POLE SYSTEM IS DEPENDENT UPON THE INSTALLED SIZE AND QUALITY, MAINTAINED SOUND CONDITION AND STRENGTH OF THESE FIELD WELDED CONNECTIONS. **ANY CORROSION OF, DAMAGE TO, FATIGUE, FRACTURE, AND/OR DETERIORATION OF THESE WELDS AND/OR THE CONNECTED COMPONENTS WILL RESULT IN THE LOSS OF STRUCTURAL LOAD CARRYING CAPACITY AND MAY LEAD TO FAILURE OF THE STRUCTURAL SYSTEM. THEREFORE, IT IS IMPERATIVE THAT THE OWNER REGULARLY INSPECTS, MAINTAINS, AND REPAIRS AS NECESSARY, ALL OF THESE WELDS, CONNECTIONS, AND COMPONENTS FOR THE LIFE OF THE STRUCTURE.**
3. THE OWNER SHALL REFER TO TIA/EIA-222-F-1996, SECTION 14 AND ANNEX E FOR RECOMMENDATIONS FOR MAINTENANCE AND INSPECTION. THE FREQUENCY OF THE INSPECTION AND MAINTENANCE INTERVALS IS TO BE DETERMINED BY THE OWNER BASED UPON ACTUAL SITE AND ENVIRONMENTAL CONDITIONS. **PAUL J. FORD & COMPANY RECOMMENDS THAT A COMPLETE AND THOROUGH INSPECTION OF THE ENTIRE REINFORCED MONOPOLE STRUCTURAL SYSTEM BE PERFORMED YEARLY AND/OR AS FREQUENTLY AS CONDITIONS WARRANT.** ACCORDING TO TIA/EIA-222-F-1996 SECTION 14.1, NOTE 1: "IT IS RECOMMENDED THAT THE STRUCTURE BE INSPECTED AFTER SEVERE WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS".

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BU #806376; HRT 100 943239
EAST HARTFORD, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-0342	ISSUE DATE OF PERMIT: 2-26-2013
DRAWN BY: B.M.S.	
CHECKED BY: R.M.K.	
APPROVED BY:	S-2
DATE: 2-26-2013	

AJAX BOLT NOTE SHEET: REV. 1.3, 11-07-2012

NOTES:

1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

3. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL BELOW FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

4. ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. DTI'S SHALL BE THE SQUIRTER® STYLE, MADE TO ASTM F959 LATEST REVISION; AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF RC 38 OR HIGHER.

NOTES FOR AJAX M20 'ONE-SIDE' BOLTS WITH DIRECT TENSION INDICATORS (DTI'S):

DTI'S REQUIRED: DTI'S SHALL BE "SELF-INDICATING" SQUIRTER® STYLE DTI'S MADE WITH SILICONE EMBEDDED IN THEM, INSPECTED BY MEANS OF THE VISUAL EJECTION OF SILICONE AS THE DTI PROTRUSIONS COMPRESS. SQUIRTER® DTI'S SHALL BE CALIBRATED PER MANUFACTURER'S INSTRUCTIONS PRIOR TO USE.

THE DIRECT TENSION INDICATOR (DTI) WASHERS SHALL BE THE "SQUIRTER® STYLE" AS MANUFACTURED BY:

APPLIED BOLTING TECHNOLOGY PRODUCTS, INC.
1413 ROCKINGHAM ROAD BELLOWS FALLS, VERMONT, USA 05101
PHONE 1-800-552-1999
WEBSITE: WWW.APPLIEDBOLTING.COM

DISTRIBUTORS OF SQUIRTER® DTI'S:
HTTP://WWW.APPLIEDBOLTING.COM/APPLIED-BOLTING-DISTRIBUTORS.HTML

DTI: USE DIRECT TENSION INDICATOR (DTI) WASHERS COMPATIBLE WITH 20 MM (M20) NOMINAL A325 BOLTS FOR THE AJAX M20 BOLTS. DTI'S SHALL NOT BE HOT-DIP GALVANIZED. DTI'S SHALL BE MECHANICALLY GALVANIZED (MG) BY THE COLD MECHANICAL PROCESS ONLY AS PROVIDED BY THE DTI MANUFACTURER.

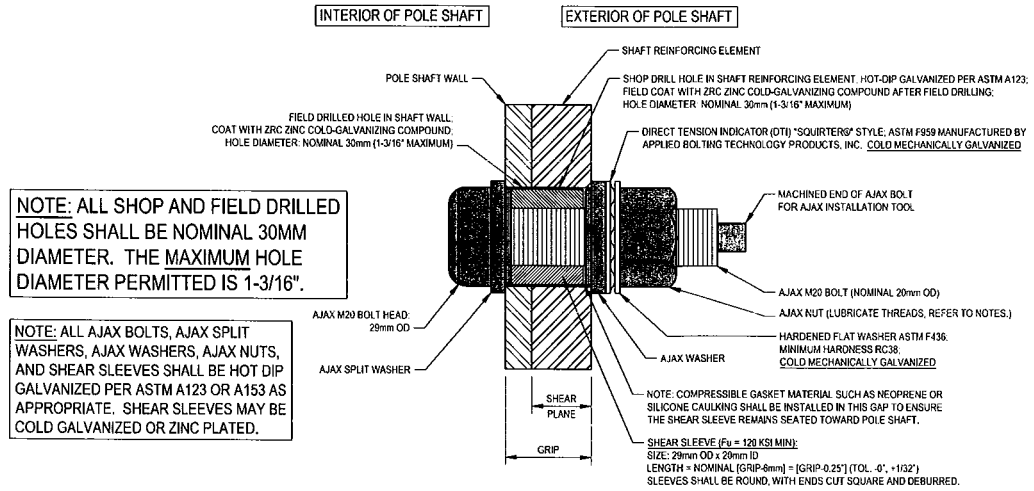
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 20 MM (M20) NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY GALVANIZED BY THE COLD MECHANICAL PROCESS. ALTERNATIVELY, CORRECTLY MADE HOT DIP GALVANIZED HARDENED FLAT WASHERS HAVING A MINIMUM HARDNESS OF RC 38 CAN BE USED; CONTRACTOR SHALL PROVIDE DOCUMENTATION OF WASHER SPECIFICATION AND HARDNESS.

NUT LUBRICATION REQUIRED: PROPERLY LUBRICATE THE THREADS OF THE NUT OF THE AJAX BOLT SO THAT IT CAN BE PROPERLY TIGHTENED WITHOUT GALLING AND/OR LOCKING UP ON THE BOLT THREADS. CONTRACTOR SHALL FOLLOW DTI MANUFACTURER INSTRUCTIONS FOR PROPER LUBRICATION AND TIGHTENING.

NOTE: COMPLETELY COMPRESSED DTI'S SHOWING NO VISIBLE REMAINING GAP ARE ACCEPTABLE. DTI WASHERS SHALL BE PLACED DIRECTLY AGAINST THE OUTER AJAX WASHER WITH THE DTI BUMPS FACING AWAY FROM THE AJAX WASHER. PLACE A HARDENED WASHER BETWEEN THE DTI AND THE AJAX NUT. THE DTI BUMPS SHALL BEAR AGAINST THE UNDERSIDE OF A HARDENED FLAT WASHER, NEVER DIRECTLY AGAINST THE NUT.

CONTRACTOR SHALL FOLLOW DTI MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

INSPECTION REQUIRED: ALL AJAX BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009, BY A QUALIFIED BOLT INSPECTOR. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT: THE SHOP-DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE AJAX BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION; AND THE CONTRACTOR'S TENSIONING PROCEDURE. IN ADDITION, ALL AJAX BOLTS AND DTI'S SHALL BE VISUALLY INSPECTED ACCORDING TO THE DTI MANUFACTURER'S INSTRUCTIONS. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE PHOTO DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THE CONDITION OF THE DTI'S.



NOTE: ALL SHOP AND FIELD DRILLED HOLES SHALL BE NOMINAL 30MM DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1-3/16".

NOTE: ALL AJAX BOLTS, AJAX SPLIT WASHERS, AJAX WASHERS, AJAX NUTS, AND SHEAR SLEEVES SHALL BE HOT DIP GALVANIZED PER ASTM A123 OR A153 AS APPROPRIATE. SHEAR SLEEVES MAY BE COLD GALVANIZED OR ZINC PLATED.

TYPICAL AJAX BOLT DETAIL 1 / S-3

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NOTE: NO DETAILED INFORMATION REGARDING INTERFERENCES WAS PROVIDED. THEREFORE, CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT ANY AND ALL DISCREPANCIES TO PAUL J. FORD AND COMPANY AND CROWN CASTLE FIELD PERSONNEL IMMEDIATELY.

THIS POLE REINFORCEMENT DRAWING IS FOR THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF CO-LOCATION ANALYSIS FOR THIS SITE (PJF#37513-0342), DATED 2-26-2013.

POLE SPECIFICATIONS	
POLE SHAPE TYPE:	12-SIDED POLYGON
TAPER:	0.249795 IN/FT
SHAFT STEEL:	ASTM A572 GRADE 65
BASE PL STEEL:	ASTM A633 GR. E (60 KSI)
ANCHOR RODS:	2 1/4"Ø #18J ASTM A615 GRADE 75

SHAFT SECTION DATA					
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN)	
				@ TOP	@ BOTTOM
1	21.00	0.1875	48.00 59.00	10.525	15.525
2	40.00	0.2500		15.525	25.531
3	39.92	0.3125		24.030	34.015
4	39.00	0.3438		32.158	41.900
NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES					

CONTRACTOR SHALL PROVIDE ASTM A36 SHIM PLATES BELOW SLIP JOINTS. THE SHIM PLATES SHALL BE PLACED BETWEEN THE NEW SHAFT REINFORCEMENT AND THE EXISTING POLE SHAFT FROM THE SLIP JOINT TO THE NEW SHAFT REINFORCEMENT SPLICE PLATE LOCATION AND A EXTRA LONG "SPLICE SHIM" SHALL BE PLACED BETWEEN THE NEW UPPER AND LOWER SHAFT REINFORCEMENT PLATES AT THE SHAFT REINFORCEMENT SPLICE PLATE LOCATION.

NOTES:

1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

3. * ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL ON SHEET S-3 FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

4. DTIS REQUIRED: * ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTIS) AND HARDENED WASHERS. DTIS SHALL BE THE SQUIRTER® STYLE, MADE TO ASTM F959 LATEST REVISION: AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF RC 38 OR HIGHER.

5. NUT LUBRICATION REQUIRED: * PROPERLY LUBRICATE THE THREADS OF THE NUT OF THE AJAX BOLT SO THAT IT CAN BE PROPERLY TIGHTENED WITHOUT GALLING AND/OR LOCKING UP ON THE BOLT THREADS. CONTRACTOR SHALL FOLLOW DTI MANUFACTURER INSTRUCTIONS FOR PROPER LUBRICATION AND TIGHTENING. REFER TO SHEET S-3.

6. AJAX BOLT HOLE SIZE: ALL SHOP- AND FIELD-DRILLED HOLES SHALL BE NOMINAL 30MM DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1-3/16". REFER TO SHEET S-3.

* AS OF 5/30/2012, UNTIL FURTHER NOTICE, CROWN CASTLE WILL ACCEPT AJAX BOLTS TIGHTENED USING AISC "TURN-OF-THE-NUT" METHODOLOGY. INSTALLERS SHALL FOLLOW CROWN GUIDELINES FOR AISC "TURN-OF-THE-NUT" METHOD AND ALSO PROVIDE COMPLETE INSPECTION DOCUMENTATION IN THE PMI.

NEW AEROSOLUTIONS MP3 REINFORCING (OPTION #1)

ELEVATION	FLAT #	REINFORCING ELEMENT
0'-6" TO 20'-6"	3, 8 & 11	MP305
15'-3" TO 45'-3"	1, 5 & 9	MP304
42'-5" TO 72'-5"	4, 8 & 12	MP304
70'-1" TO 85'-1"	1, 5 & 9	MP303

ALL BOLTS SHALL BE AJAX M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 WITH MIN. Fu=105 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE & BOLTS) AND INSTALLATION PROCEDURES.

NEW SABRE FLAT PLATE REINFORCING (OPTION #2)

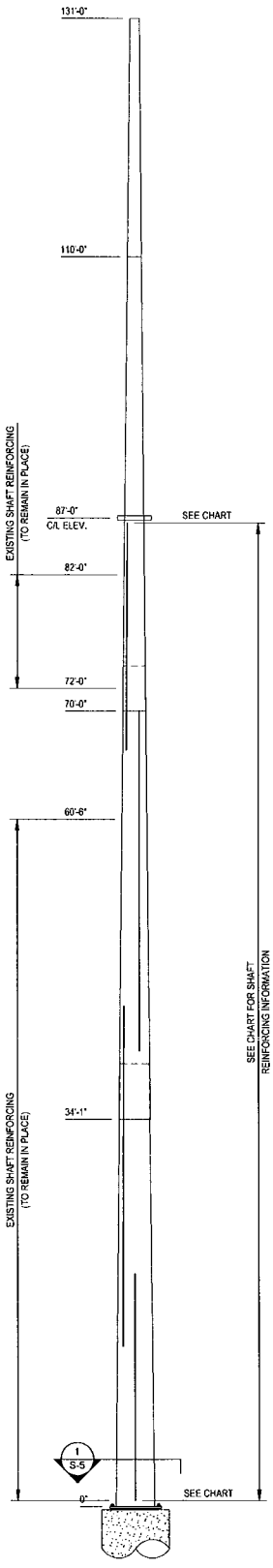
ELEVATION	FLAT #	REINFORCING ELEMENT
0'-6" TO 20'-6"	3, 8 & 11	MS-650
14'-1" TO 44'-1"	1, 5 & 9	MS-600
40'-1" TO 70'-1"	4, 8 & 12	MS-600
66'-7" TO 86'-7"	1, 5 & 9	MS-450

ALL BOLTS SHALL BE AJAX M20 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 WITH MIN. Fu=105 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE & BOLTS) AND INSTALLATION PROCEDURES.

NEW CCI FLAT PLATE (100 KSI) REINFORCING (OPTION #3)

ELEVATION	FLAT #	REINFORCING ELEMENT
0'-6" TO 20'-6"	3, 8 & 11	ISP-UR-1004
15'-10" TO 45'-10"	1, 5 & 9	ISP-UR-0754
43'-4" TO 68'-4"	4, 8 & 12	ISP-UR-0754
65'-10" TO 85'-10"	1, 5 & 9	ISP-UR-0754

NOTES FOR CROWN REINFORCING OPTION (100 KSI) MATERIAL:
1. DO NOT FIELD WELD DIRECTLY TO THE 100 KSI MATERIAL.
2. THE 100 KSI MATERIAL SHALL CONFORM TO THE FOLLOWING:
A. MATERIAL SHALL BE ASTM A514, GRADE A, GRADE E, or GRADE P, HAVING A MINIMUM TENSILE STRENGTH (Fu) OF 110 KSI AND A MINIMUM YIELD STRENGTH (Fy) OF 100 KSI.
B. MATERIAL SHALL BE HEAT TREATED, QUENCHED AND TEMPERED PER ASTM A514.
C. MATERIAL SHALL HAVE CHARPY V-NOTCH (CVN) IMPACT VALUES OF NOT LESS THAN 15 FT-LB AT -20 DEGREES F, IN ACCORDANCE WITH ASTM A370.
D. MINIMUM INSIDE BEND RADIUS FOR COLD BENDING, PER ASTM A6 TABLE X.4.2, SHALL BE 4.5t MINIMUM.
E. ANY AND ALL WELDING TO THE MATERIAL SHALL BE PERFORMED ACCORDING TO AN APPROVED WELDING PROCEDURE SPECIFICATION (WPS) SUITABLE FOR THE GRADE AND INTENDED USE AND SERVICE. THE WPS SHALL BE DEVELOPED BY A QUALIFIED CWI AND IN ACCORDANCE WITH AWS D1.1. PRIOR TO ANY WORK, FABRICATION OR WELDING, THE WPS SHALL BE SUBMITTED TO CROWN CASTLE AND PAUL J. FORD AND COMPANY FOR REVIEW.



POLE ELEVATION 1 / S-4

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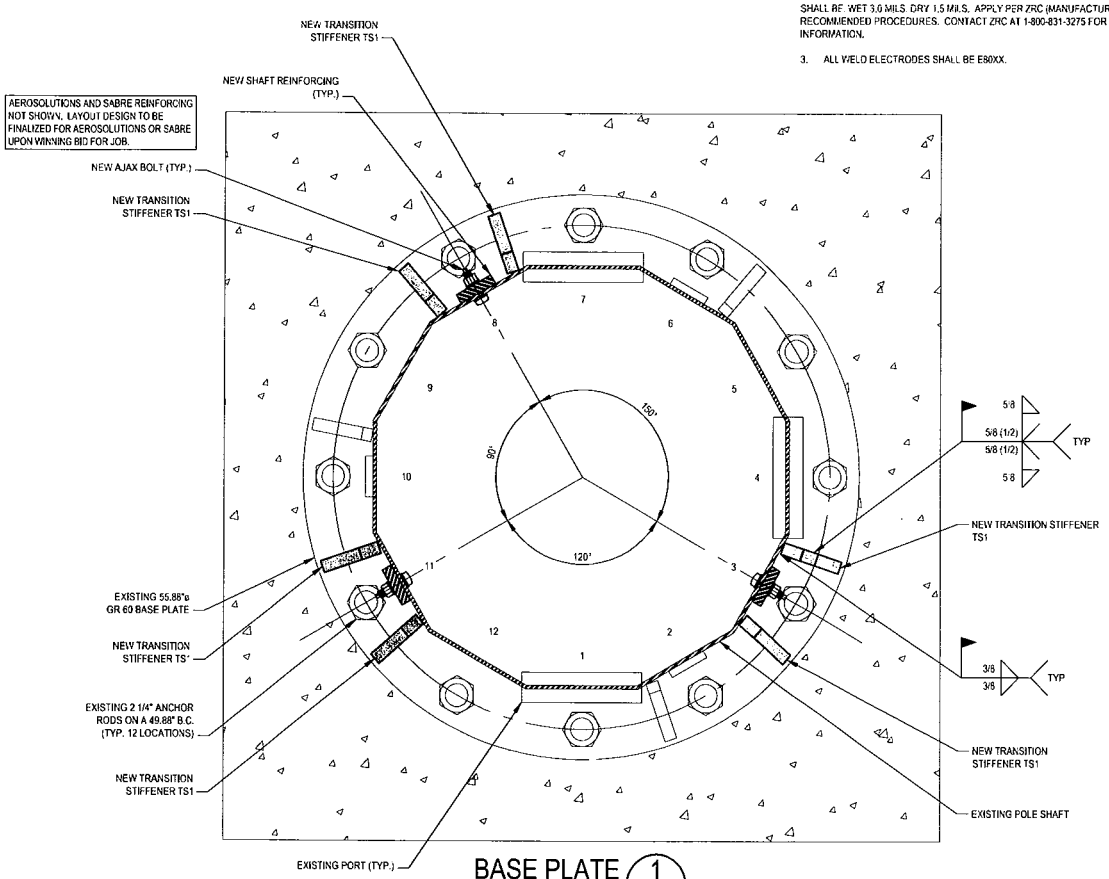
GENERAL NOTES

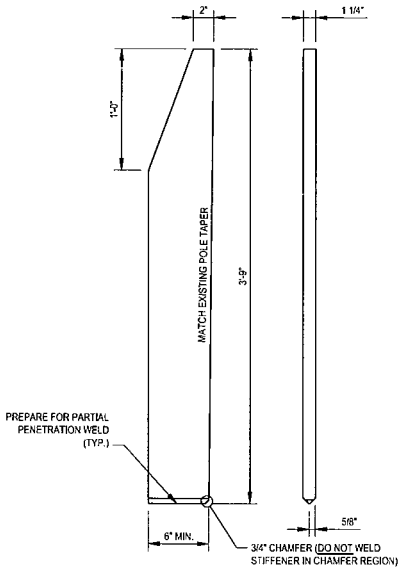
1. AJAX BOLTS ARE TO BE 20 mm Ø WITH CORRESPONDING 29 mm Ø SHEAR SLEEVE WITH MATCHING STEEL GRADE. DRILLED HOLE DIAMETERS IN REINFORCING STEEL AND EXISTING SHAFT SHALL BE 1 3/16"ø MAX.

2. ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC -RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS, DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.

3. ALL WELD ELECTRODES SHALL BE E80XX.



BASE PLATE 1/S-5



TRANSITION STIFFENER MK~TS1

(6 REQUIRED) (Fy = 65 KSI)

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MODIFICATION INSPECTION NOTES:

GENERAL
THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATION AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR)

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF. NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES

ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-BUL-10173 LIST OF APPROVED MI VENDORS

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN POINT OF CONTACT (POC)

REFER TO ENG-SOW-10007 MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS

MI INSPECTOR
THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN

GENERAL CONTRACTOR
THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-10007

RECOMMENDATIONS
THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE

CANCELLATION OR DELAYS IN SCHEDULED MI
IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED

CORRECTION OF FAILING MI'S
IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION

MI VERIFICATION INSPECTIONS
CROWN RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

PHOTOGRAPHS
BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS. PLEASE REFER TO ENG-SOW-10007

MI CHECKLIST	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWINGS
X	EOR APPROVED SHOP DRAWINGS
X	FABRICATION INSPECTION
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
NA	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
X	INSPECTION OF BOLT PRETENSION PER AISC BOLT SPEC.
X	INSPECTION OF AJAX BOLTS AND DTIS PER REQUIREMENTS ON SHEET S-3
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
NA	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT

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BU #806376; HRT 100 943239
EAST HARTFORD, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-0342	ISSUE DATE OF PERMIT: 2-26-2013
DRAWN BY: B.M.S.	
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APPROVED BY:	S-6
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CROWN CASTLE PROJECT: BU #806376; HRT 100 943239; EAST HARTFORD, CT
MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 12/2/2009)

UPON THE SUCCESSFUL AND COMPLETE INSTALLATION OF THE REINFORCING SYSTEM SPECIFIED IN THESE PLANS, THE REINFORCED POLE MEETS THE WIND DESIGN RECOMMENDATIONS OF THE TIA/EIA-222-F-1996 STANDARD FOR WIND SPEEDS OF 80 MPH AND 38 MPH + 1/4" RADIAL ICE

A. GENERAL NOTES

1. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO FABRICATION AND CONSTRUCTION. THESE DRAWINGS WERE PREPARED FROM INFORMATION AND DOCUMENTS PROVIDED TO PAUL J. FORD & COMPANY BY CROWN CASTLE. THIS INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY PAUL J. FORD & COMPANY FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANTICIPATED. ANY DISCREPANCIES AND/OR CHANGES BETWEEN THE INFORMATION CONTAINED IN THESE DRAWINGS AND THE ACTUAL VERIFIED SITE CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF CROWN CASTLE AND PAUL J. FORD & COMPANY SO THAT ANY CHANGES AND/OR ADJUSTMENTS, IF NECESSARY, CAN BE MADE TO THE DESIGN AND DRAWINGS.
2. THE EXISTING UNREINFORCED MONOPOLE STRUCTURE DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE ANTENNA AND PLATFORM LOADS SHOWN ON THESE DRAWINGS AT THE REQUIRED MINIMUM TIA/EIA-222-F-1996 BASIC WIND SPEEDS. DO NOT INSTALL ANY ADDITIONAL OR NEW ANTENNA AND PLATFORM LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
3. IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.
4. THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCING REPAIR SYSTEM HAS BEEN PROPERLY AND ADEQUATELY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO INSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT. IMPORTANT CUTTING, WELDING AND SAFETY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE PREVENTION AND SAFETY GUIDELINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES FROM CROWN CASTLE. PER THE 12-01-2005 CROWN CASTLE DIRECTIVE: "ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY 'CUTTING AND WELDING PLAN' (DOC # ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT."
5. THE STRUCTURAL CONTRACT DOCUMENTS DO NOT INDICATE THE METHOD OR MEANS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE OWNER AND/OR THE ENGINEER SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES.
6. ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY THE INSPECTION/TESTING AGENCY. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
7. ALL MATERIALS AND EQUIPMENT FURNISHED WILL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO INSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.
10. ANY EXISTING ATTACHMENTS AND/OR PROJECTIONS ON THE POLE THAT MAY INTERFERE WITH THE INSTALLATION OF THE REINFORCING SYSTEM WILL HAVE TO BE REMOVED, AND/OR RELOCATED, AND/OR REPLACED AND RE-INSTALLED AFTER THE REINFORCING IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND COORDINATE THESE ITEMS PRIOR TO CONSTRUCTION WITH THE OWNER, TESTING AGENCY, AND ENGINEER.
11. ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFT REINFORCING MUST BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SUPPORTED TO PERMIT NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM, THE CONTRACTOR SHALL RE-INSTALL THE PLATFORMS. IN NO CASE SHALL ANY NEW AND/OR ADDITIONAL PLATFORMS AND/OR ANTENNAS AND/OR COAX CABLES AND/OR OTHER EQUIPMENT BE INSTALLED ON THE MONOPOLE UNTIL THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF ALL OF THE REQUIRED STRUCTURAL REINFORCING SYSTEM COMPONENTS.

B. "LOW HEAT" WELDING PROCEDURES - (NOT REQUIRED)

C. SPECIAL INSPECTION AND TESTING

1. ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY THE OWNER'S REPRESENTATIVE AND THE OWNER'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY. REFER TO CROWN CASTLE DOCUMENT ENG-SOW-10096 FOR SPECIFICATION.
2. ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE PERFORMED SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
3. OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
4. AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY THE OWNER FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
   (A.) ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
   (B.) THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
5. THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES FOR THE OWNER. THE TESTING AGENCY SHALL INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.
   A. GENERAL:
      (1.) PERFORM CONTINUOUS ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY OWNER IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.
   B. FOUNDATIONS, CONCRETE, AND SOIL PREPARATION - (NOT REQUIRED)
   C. CONCRETE TESTING PER ACI - (NOT REQUIRED)
   D. STRUCTURAL STEEL
      (1.) CHECK THE STEEL ON THE JOB WITH THE PLANS.
      (2.) CHECK MILL CERTIFICATIONS.
      (3.) CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
      (4.) INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
      (5.) CALL FOR LABORATORY TEST REPORTS WHEN IN DOUBT.
      (6.) CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
      (7.) CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
      (8.) CHECK BOLT TIGHTENING ACCORDING TO AISC TURN OF THE NUT METHOD
   E. WELDING:
      (1.) VERIFY FIELD WELDING PROCEDURES, WELDERS AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
      (2.) INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND IN ACCORDANCE WITH AWS D1.1.
      (3.) APPROVE FIELD WELDING SEQUENCE
         (A.) A PROGRAM OF THE APPROVED SEQUENCES SHALL BE SUBMITTED TO THE OWNER BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISS ON FROM THE OWNER.
      (4.) INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
         (A.) INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE AND WORKING CONDITIONS.
         (B.) VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
         (C.) INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
         (D.) VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1.
         (E.) SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE OR DYE PENETRANT.
         (F.) INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED PLANS.
         (G.) VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
         (H.) REVIEW THE REPORTS BY TESTING LABS.
         (I.) CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
         (J.) INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
         (K.) CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.
   F. SPECIAL INSPECTION OF EXISTING SHAFT-TO-FLANGE WELD CONNECTIONS - (NOT REQUIRED)
   G. REPORTS:
      (1.) COMPILE AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO THE OWNER.
6. THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES AND PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO THE OWNER'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT THE OWNER'S REVIEW AND SPECIFIC WRITTEN CONSENT. THE OWNER RESERVES THE RIGHT TO DETERMINE WHAT IS AN ACCEPTABLE RESOLUTION OF DISCREPANCIES AND PROBLEMS.
7. AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO THE OWNER. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.
8. RESPONSIBILITY: THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.

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BU #806376; HRT 100 943239
EAST HARTFORD, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT NO: 37513-0342	ISSUE DATE OF PERMIT: 2-26-2013
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D. **STRUCTURAL STEEL**

1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:

A. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
   (A.) "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
   (B.) "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION.
   (C.) "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (PARAGRAPH 4.2.1 SPECIFICALLY EXCLUDED).

B. BY THE AMERICAN WELDING SOCIETY (AWS):
   (A.) "STRUCTURAL WELDING CODE - STEEL D1.1."
   (B.) "SYMBOLS FOR WELDING AND NON-DESTRUCTIVE TESTING"

2. ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
3. TIGHTEN ALL STRUCTURAL BOLTS, INCLUDING THE AJAX M20 BOLTS WITH SHEAR SLEEVES, ACCORDING TO THE REQUIREMENTS OF THE AISC "TURN OF THE NUT" METHOD. TIGHTEN BOLTS 1/3 TURN PAST THE SNUG TIGHT CONDITION AS DEFINED BY AISC.
4. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E80XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO THE OWNER'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65 (FY = 65 KSI MIN.) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
7. SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS. SEE SECTION I NOTES REGARDING TOUCH-UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS FIELD WELDING.
8. UNLESS OTHERWISE NOTED, ALL STEEL MEMBERS SHALL BE HOT-DIP GALVANIZED, AFTER FABRICATION, IN ACCORDANCE WITH ASTM A123. SEE SECTION J FOR FURTHER NOTES AND FOR EXCEPTIONS (IF ANY).
9. ALL WELDS SHALL BE VISUALLY INSPECTED BY THE OWNER'S APPROVED TESTING AGENCY. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT. THE CONTRACTOR SHALL COOPERATE WITH THE TESTING AGENCY IN THEIR TESTING EFFORTS.
10. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
11. FIELD CUTTING OF STEEL:
   (A.) PRIOR TO ANY FIELD CUTTING, THE CONTRACTOR SHALL MARK THE CUT OUTLINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS.
   (B.) ANY REQUIRED CUTS IN THE STEEL SHALL BE CAREFULLY CUT BY MECHANICAL METHODS SUCH AS DRILLING, SAW CUTTING, AND GRINDING. THE CONTRACTOR IS RESPONSIBLE TO PREVENT ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE DURING THE CUTTING WORK. ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
   (C.) ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.

E. **BASE PLATE GROUT - (NOT REQUIRED)**

F. **FOUNDATION WORK - (NOT REQUIRED)**

G. **CAST-IN-PLACE CONCRETE - (NOT REQUIRED)**

H. **EPOXY GROUTED REINFORCING ANCHOR RODS - (NOT REQUIRED)**

I. **TOUCH UP OF GALVANIZING**

1. THE CONTRACTOR SHALL TOUCH UP ANY AND/OR ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. **GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL FIELD WELDING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.**
2. CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS ON GALVANIZED AND PRIME PAINTED SURFACES FOR TOUCH-UP COATING IN ACCORDANCE WITH AWS D1.1. THE OWNER'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH-UP COATING.
3. THE OWNER'S TESTING AGENCY SHALL TEST AND VERIFY THE COATING THICKNESS AFTER THE CONTRACTOR HAS APPLIED THE ZRC COLD GALVANIZING COMPOUND AND IT HAS SUFFICIENTLY DRIED. AREAS FOUND TO BE INADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

J. **HOT DIP GALVANIZING**

1. HOT-DIP GALVANIZE ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR PER ASTM A153, AS APPROPRIATE.
2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING.
3. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES AS REQUIRED.
4. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

K. **PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER**

1. AFTER THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF THE MONOPOLE REINFORCING SYSTEM AND THE WORK HAS BEEN ACCEPTED BY THE OWNER, THE OWNER WILL BE RESPONSIBLE FOR THE LONG TERM AND PERPETUAL INSPECTION AND MAINTENANCE OF THE POLE AND REINFORCING SYSTEM.
2. THE MONOPOLE REINFORCING SYSTEM INDICATED IN THESE DOCUMENTS USES REINFORCING COMPONENTS THAT INVOLVE FIELD WELDING STEEL MEMBERS TO THE EXISTING GALVANIZED STEEL POLE STRUCTURE. THESE FIELD WELDED CONNECTIONS ARE SUBJECT TO CORROSION DAMAGE AND DETERIORATION IF THEY ARE NOT PROPERLY MAINTAINED AND COVERED WITH CORROSION PREVENTIVE COATING SUCH AS THE ZRC GALVANIZING COMPOUND SPECIFIED PREVIOUSLY. THE STRUCTURAL LOAD CARRYING CAPACITY OF THE REINFORCED POLE SYSTEM IS DEPENDENT UPON THE INSTALLED SIZE AND QUALITY, MAINTAINED SOUND CONDITION AND STRENGTH OF THESE FIELD WELDED CONNECTIONS. **ANY CORROSION OF, DAMAGE TO, FATIGUE, FRACTURE, AND/OR DETERIORATION OF THESE WELDS AND/OR THE CONNECTED COMPONENTS WILL RESULT IN THE LOSS OF STRUCTURAL LOAD CARRYING CAPACITY AND MAY LEAD TO FAILURE OF THE STRUCTURAL SYSTEM. THEREFORE, IT IS IMPERATIVE THAT THE OWNER REGULARLY INSPECTS, MAINTAINS, AND REPAIRS AS NECESSARY, ALL OF THESE WELDS, CONNECTIONS, AND COMPONENTS FOR THE LIFE OF THE STRUCTURE.**
3. THE OWNER SHALL REFER TO TIA/EIA-222-F-1996, SECTION 14 AND ANNEX E FOR RECOMMENDATIONS FOR MAINTENANCE AND INSPECTION. THE FREQUENCY OF THE INSPECTION AND MAINTENANCE INTERVALS IS TO BE DETERMINED BY THE OWNER BASED UPON ACTUAL SITE AND ENVIRONMENTAL CONDITIONS. **PAUL J. FORD & COMPANY RECOMMENDS THAT A COMPLETE AND THOROUGH INSPECTION OF THE ENTIRE REINFORCED MONOPOLE STRUCTURAL SYSTEM BE PERFORMED YEARLY AND/OR AS FREQUENTLY AS CONDITIONS WARRANT.** ACCORDING TO TIA/EIA-222-F-1996 SECTION 14.1, NOTE 1: "IT IS RECOMMENDED THAT THE STRUCTURE BE INSPECTED AFTER SEVERE WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS".

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PH: (855)895-9442 FAX: (855)895-9443

BU #806376; HRT 100 943239
EAST HARTFORD, CT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT NO: 37513-0342
DRAWN BY: B.M.S
CHECKED BY: R.M.K.
APPROVED BY:
DATE: 2-26-2013

ISSUE DATE OF PERMIT: 2-26-2013

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AJAX BOLT NOTE SHEET: REV. 1.3, 11-07-2012

NOTES: 1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

3. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL BELOW FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

4. ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. DTI'S SHALL BE THE SQUIRTER® STYLE, MADE TO ASTM F959 LATEST REVISION; AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF RC 38 OR HIGHER.

NOTES FOR AJAX M20 'ONE-SIDE' BOLTS WITH DIRECT TENSION INDICATORS (DTI'S):

DTI'S REQUIRED: DTI'S SHALL BE "SELF-INDICATING" SQUIRTER® STYLE DTI'S MADE WITH SILICONE EMBEDDED IN THEM, INSPECTED BY MEANS OF THE VISUAL EJECTION OF SILICONE AS THE DTI PROTRUSIONS COMPRESS. SQUIRTER® DTI'S SHALL BE CALIBRATED PER MANUFACTURER'S INSTRUCTIONS PRIOR TO USE.

THE DIRECT TENSION INDICATOR (DTI) WASHERS SHALL BE THE 'SQUIRTER® STYLE" AS MANUFACTURED BY:

APPLIED BOLTING TECHNOLOGY PRODUCTS, INC.
1413 ROCKINGHAM ROAD BELLOWS FALLS, VERMONT, USA 05101
PHONE 1-800-552-1999
WEBSITE: WWW.APPLIEDBOLTING.COM

DISTRIBUTORS OF SQUIRTER® DTI'S:
HTTP://WWW.APPLIEDBOLTING.COM/APPLIED-BOLTING-DISTRIBUTORS.HTML

DTI: USE DIRECT TENSION INDICATOR (DTI) WASHERS COMPATIBLE WITH 20 MM (M20) NOMINAL A325 BOLTS FOR THE AJAX M20 BOLTS. DTI'S SHALL NOT BE HOT-DIP GALVANIZED. DTI'S SHALL BE MECHANICALLY GALVANIZED (MG) BY THE COLD MECHANICAL PROCESS ONLY AS PROVIDED BY THE DTI MANUFACTURER.

HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 20 MM (M20) NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY GALVANIZED BY THE COLD MECHANICAL PROCESS. ALTERNATIVELY, CORRECTLY MADE HOT DIP GALVANIZED HARDENED FLAT WASHERS HAVING A MINIMUM HARDNESS OF RC 38 CAN BE USED; CONTRACTOR SHALL PROVIDE DOCUMENTATION OF WASHER SPECIFICATION AND HARDNESS.

NUT LUBRICATION REQUIRED: PROPERLY LUBRICATE THE THREADS OF THE NUT OF THE AJAX BOLT SO THAT IT CAN BE PROPERLY TIGHTENED WITHOUT GALLING AND/OR LOCKING UP ON THE BOLT THREADS. CONTRACTOR SHALL FOLLOW DTI MANUFACTURER INSTRUCTIONS FOR PROPER LUBRICATION AND TIGHTENING.

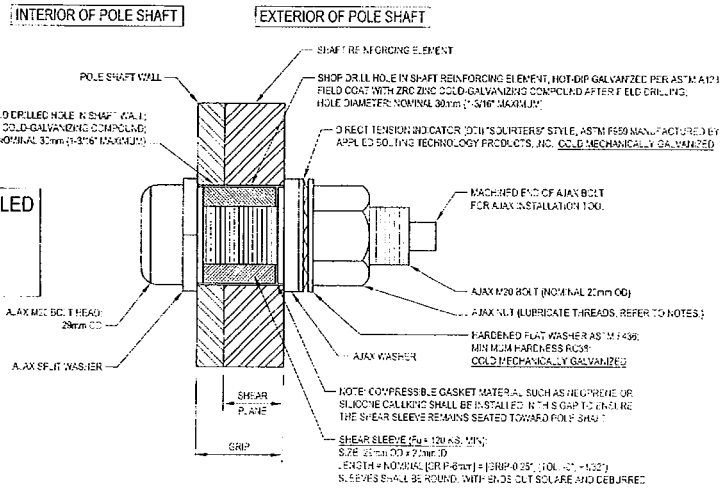
NOTE: COMPLETELY COMPRESSED DTI'S SHOWING NO VISIBLE REMAINING GAP ARE ACCEPTABLE. DTI WASHERS SHALL BE PLACED DIRECTLY AGAINST THE OUTER AJAX WASHER WITH THE DTI BUMPS FACING AWAY FROM THE AJAX WASHER. PLACE A HARDENED WASHER BETWEEN THE DTI AND THE AJAX NUT. THE DTI BUMPS SHALL BEAR AGAINST THE UNDERSIDE OF A HARDENED FLAT WASHER, NEVER DIRECTLY AGAINST THE NUT.

CONTRACTOR SHALL FOLLOW DTI MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

INSPECTION REQUIRED: ALL AJAX BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009, BY A QUALIFIED BOLT INSPECTOR. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT: THE SHOP DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE AJAX BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION; AND THE CONTRACTOR'S TENSIONING PROCEDURE. IN ADDITION, ALL AJAX BOLTS AND DTI'S SHALL BE VISUALLY INSPECTED ACCORDING TO THE DTI MANUFACTURER'S INSTRUCTIONS. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE PHOTO DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THE CONDITION OF THE DTI'S.

NOTE: ALL SHOP AND FIELD DRILLED HOLES SHALL BE NOMINAL 30MM DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1-3/16".

NOTE: ALL AJAX BOLTS, AJAX SPLIT WASHERS, AJAX WASHERS, AJAX NUTS, AND SHEAR SLEEVES SHALL BE HOT DIP GALVANIZED PER ASTM A123 OR A153 AS APPROPRIATE. SHEAR SLEEVES MAY BE COLD GALVANIZED OR ZINC PLATED.



TYPICAL AJAX BOLT DETAIL 1 S-3

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NOTE: NO DETAILED INFORMATION REGARDING INTERFERENCES WAS PROVIDED. THEREFORE, CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT ANY AND ALL DISCREPANCIES TO PAUL J. FORD AND COMPANY AND CROWN CASTLE FIELD PERSONNEL IMMEDIATELY.

THIS POLE REINFORCEMENT DRAWING IS FOR THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF CO-LOCATION ANALYSIS FOR THIS SITE (PJF#37513-0342), DATED 2-26-2013.

POLE SPECIFICATIONS

POLE SHAPE TYPE:	12-SIDED POLYGON
TAPER:	0.249795 IN/FT
SHAFT STEEL:	ASTM A572 GRADE 65
BASE PL STEEL:	ASTM A595 GR. E (65 KSI)
ANCHOR RODS:	2 1/4"Ø
	#18 ASTM A615 GRADE 75

SHAFT SECTION DATA

SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN) @ TOP	@ BOTTOM
1	21.00	0.1875		15.625	15.625
2	40.00	0.2500		15.625	25.531
3	39.92	0.3125	48.00	24.031	34.016
4	39.00	0.3438	50.00	32.156	41.906

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

CONTRACTOR SHALL PROVIDE ASTM A36 SHIM PLATES BELOW SLIP JOINTS. THE SHIM PLATES SHALL BE PLACED BETWEEN THE NEW SHAFT REINFORCEMENT AND THE EXISTING POLE SHAFT FROM THE SLIP JOINT TO THE NEW SHAFT REINFORCEMENT SPLICE PLATE LOCATION AND A EXTRA LONG SPLICE SHIM SHALL BE PLACED BETWEEN THE NEW UPPER AND LOWER SHAFT REINFORCEMENT PLATES AT THE SHAFT REINFORCEMENT SPLICE PLATE LOCATION.

NOTES:

1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS, DEC. 31, 2009.

2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS, DEC. 31, 2009.

3. * ALL AJAX M39 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL ON SHEET S-5 FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M39 BOLTS.

4. DTI'S REQUIRED: * ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. DTI'S SHALL BE THE SQUIRTER'S STYLE, MADE TO ASTM F959 LATEST REVISION, AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF RC 38 OR HIGHER.

5. NUT LUBRICATION REQUIRED: * PROPERLY LUBRICATE THE THREADS OF THE NUT OF THE AJAX BOLT SO THAT IT CAN BE PROPERLY TIGHTENED WITHOUT GALLING AND/OR LOCKING UP ON THE BOLT THREADS. CONTRACTOR SHALL FOLLOW THE MANUFACTURER INSTRUCTIONS FOR PROPER LUBRICATION AND TIGHTENING. REFER TO SHEET S-5.

6. AJAX BOLT HOLE SIZE: ALL SHOP- AND FIELD-DRILLED HOLES SHALL BE NOMINAL 50MM DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1-9/16". REFER TO SHEET S-5.

* AS OF 5/9/2012 UNTIL FURTHER NOTICE, CROWN CASTLE WILL ACCEPT AJAX BOLTS TIGHTENED USING AISC "TURN-OF-THE-NUT" METHODOLOGY. INSTALLERS SHALL FOLLOW CROWN CUDD'S NOTES FOR AISC "TURN-OF-THE-NUT" METHOD AND ALSO PROVIDE COMPLETE INSPECTION DOCUMENTATION IN THE PMI.

NEW AEROSOLUTIONS MP3 REINFORCING (OPTION #1)

ELEVATION	PLAT #	REINFORCING ELEMENT
0'-6" TO 20'-6"	3, 8 & 11	MP3C5
19'-3" TO 45'-3"	1, 5 & 9	MP3C4
42'-5" TO 72'-5"	4, 8 & 12	MP3C3
70'-1" TO 85'-1"	1, 5 & 9	MP3C3

ALL BOLTS SHALL BE AJAX M39 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 WITH MIN. Fu=105 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE & BOLTS) AND INSTALLATION PROCEDURES.

NEW SABRE FLAT PLATE REINFORCING (OPTION #2)

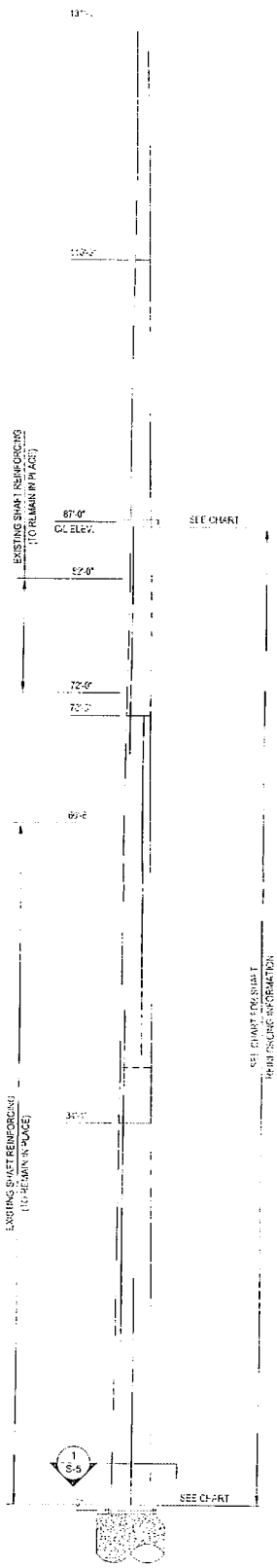
ELEVATION	PLAT #	REINFORCING ELEMENT
0'-6" TO 20'-6"	3, 8 & 11	MS-600
14'-1" TO 44'-1"	1, 5 & 9	MS-600
40'-1" TO 72'-1"	4, 8 & 12	MS-600
66'-7" TO 85'-7"	1, 5 & 9	MS-450

ALL BOLTS SHALL BE AJAX M39 BOLTS WITH HIGH STRENGTH SHEAR SLEEVES (ASTM A519 W TH MIN. Fu=105 KSI). CONTACT SUPPLIER FOR MATERIAL (PLATE & BOLTS), AND INSTALLATION PROCEDURES.

NEW CCI FLAT PLATE (100 KSI) REINFORCING (OPTION #3)

ELEVATION	PLAT #	REINFORCING ELEMENT
0'-6" TO 20'-6"	3, 8 & 11	SP-UR-1024
19'-10" TO 45'-10"	1, 5 & 9	SP-UR-0754
43'-4" TO 69'-4"	4, 8 & 12	SP-UR-0754
68'-7" TO 85'-10"	1, 5 & 9	SP-UR-0754

NOTES FOR CROWN REINFORCING OPTION (100 KSI) MATERIAL:
1. DO NOT FIELD WELD DIRECTLY TO THE 100 KSI MATERIAL.
2. THE 100 KSI MATERIAL SHALL CONFORM TO THE FOLLOWING:
A. MATERIAL SHALL BE ASTM A514, GRADE A, GRADE E, or GRADE F, HAVING A MINIMUM TENSILE STRENGTH (Fu) OF 110 KSI AND A MINIMUM YIELD STRENGTH (Fy) OF 100 KSI.
B. MATERIAL SHALL BE HEAT TREATED, QUENCHED AND TEMPERED PER ASTM A514.
C. MATERIAL SHALL HAVE CHARPY V-NOTCH (CVN) IMPACT VALUES OF NOT LESS THAN 15 FT-LB AT -20 DEGREES F, IN ACCORDANCE WITH ASTM A370.
D. MINIMUM INSIDE BEND RADIUS FOR COLD BENDING, PER ASTM AS TABLE X4.2, SHALL BE 4.5 MINIMUM.
E. ANY AND ALL WELDING TO THE MATERIAL SHALL BE PERFORMED ACCORDING TO AN APPROVED WELDING PROCEDURE SPECIFICATION (WPS) SUITABLE FOR THE GRADE AND INTENDED USE AND SERVICE. THE WPS SHALL BE DEVELOPED BY A QUALIFIED CWI AND IN ACCORDANCE WITH AWS D1.1. PRIOR TO ANY WORK, FABRICATION OR WELDING, THE WPS SHALL BE SUBMITTED TO CROWN CASTLE AND PAUL J. FORD AND COMPANY FOR REVIEW.



POLE ELEVATION 1/S-4

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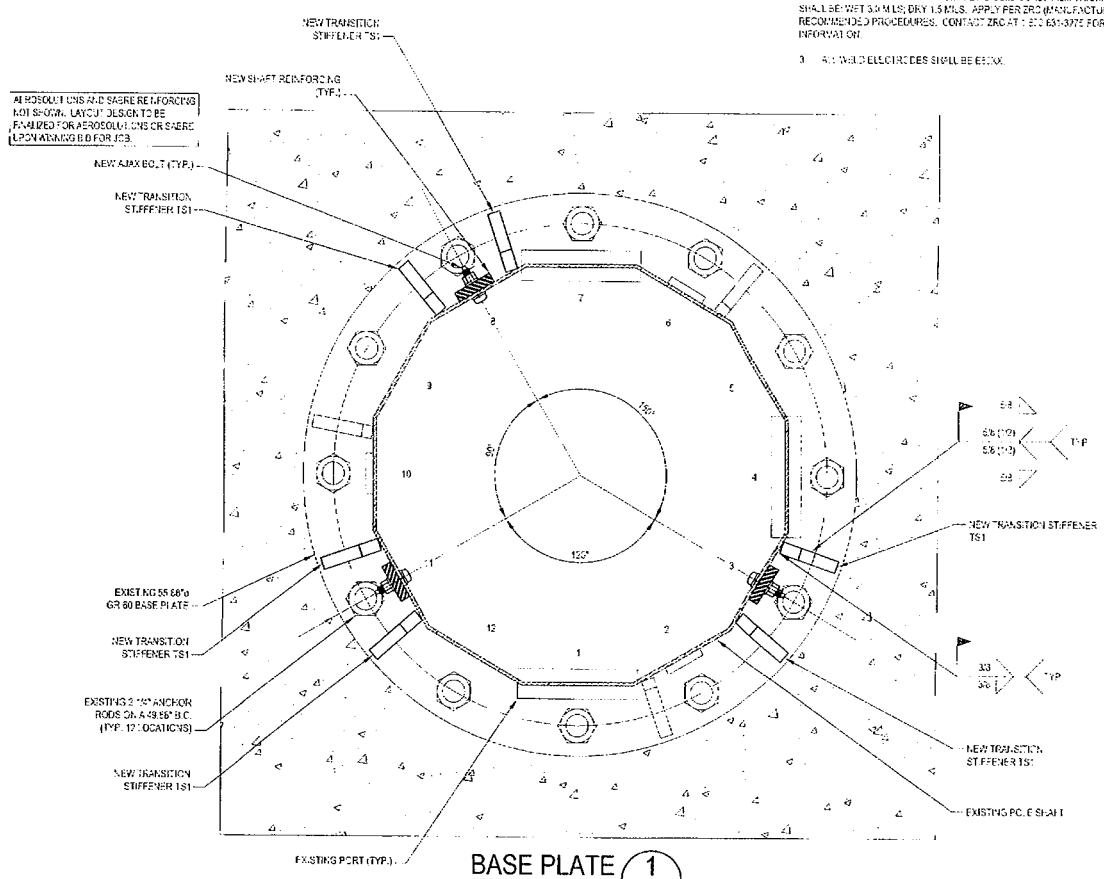
GENERAL NOTES:

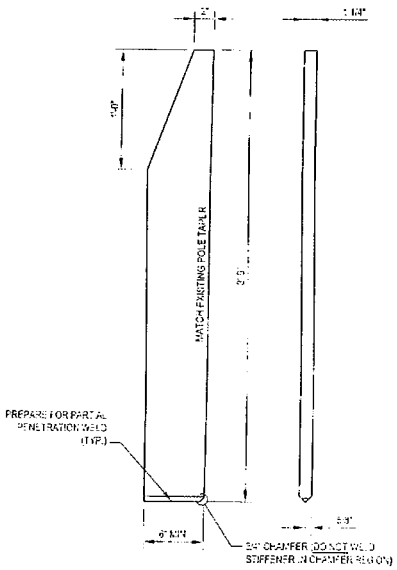
1. ANCHOR RODS TO BE LOCATED WITH A CORRESPONDING CIRCULAR TEMPLATE WITH MATCHING BOLT CIRCLE AND DRILLED HOLE DIAMETERS IN REINFORCING STEEL AND EXISTING SHAFT. SHALL BE ±1/16" MAX.

2. ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1 800 631-3072 FOR PRODUCT INFORMATION.

3. ALL WELD ELECTRODES SHALL BE E70XX.



BASE PLATE 1 / S-5



TRANSITION STIFFENER MK~TS1

(8 REQUIRED) (Fy = 65 KSI)

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MODIFICATION INSPECTION NOTES:

GENERAL
THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN, EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV), OR ENGINEERING SERVICE VENDOR (ASSV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-BUL-10473 LIST OF APPROVED MI VENDORS.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN POINT OF CONTACT (POC).

REFER TO ENG-SOW-13007 - MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

MI INSPECTOR
THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

GENERAL CONTRACTOR
THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION/INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-13007.

RECOMMENDATIONS
THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RETENSIONING OPERATIONS.
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THE DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI
IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ONSITE, ETC.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY, NO EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MI'S
IF THE MODIFICATION/INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN. ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.

MI VERIFICATION INSPECTIONS
CROWN RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-00007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/ASSV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASS MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

PHOTOGRAPHS
BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - AS-BUILT CONDITION
  - SURFACE PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL IN-FIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-13007.

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
	PRE-CONSTRUCTION
X	MI CHECKLIST DRAWINGS
X	EOR APPROVED SHOP DRAWINGS
X	FABRICATION INSPECTION
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
NA	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
	CONSTRUCTION
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMPR. STRENGTH AND SLUMP TESTS
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK LIFT AND DENSITY
X	ON SITE HOT DIP GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS BUILT DOCUMENTS
X	INSPECTION OF BOLT PRETENSION PER ASSC BOLTING
X	INSPECTION OF ANCHOR BOLTS AND DETS PER REQUIREMENTS ON SPEC SHT
ADDITIONAL TESTING AND INSPECTIONS:	
	POST-CONSTRUCTION
X	MI INSPECTOR RED LINE OR RECORD DRAWING(S)
NA	POST INSTALLED ANCHOR ROD PULL OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT

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